SACI PROJECT
PROGRESS REVIEW MEETING
November 25/26, 1971

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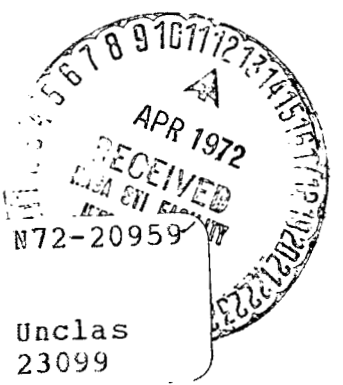

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PROJECT SACI PROGRESS REVIEW MEETING /A

November 25/26, 1971

Report LAFE-174

PR (Office of the President)
National Research Council
Institute of Space Research — INPE
São José dos Campos — São Paulo State — BRAZIL

Office of the President
National Research Council
Institute of Space Research
Sae Jose dos Campos — Sao Paulo State
BRAZIL

/B

This report presents relevant aspects of the SACI Project and its progress during the period February 19 to November 25/26, 1971, when the Meeting was held.

This publication was authorized by the undersigned.

Fernando de Mendonca
General Director

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CHAPTER I

INTRODUCTION

1. Purpose and Compilation of the Document */1

This document has the following aims:

a) to present a resume of the activities performed by the SACI Project from the Progress Review Meeting in February 1971 to the present date.

b) to supply up-to-date information on the strategy of the SACI Project — its programs, goals and plans.

In the compilation of this report our intention was not to present separately data that satisfy the above mentioned aims. We opted for an explanation of selected elements, due to their close interrelationship.

A "Progressive Detailing Approach" was used; that is, initially we present a general view of the subject matter, and details are presented gradually.

It is a revision of the Project, which supplements and brings up-to-date the following documents:

"Experiment Proposal — Brazilian Educational Radio and TV Experiment on ATS-F or G," presented by INPE (former CNAE) to NASA in July 1968.

LAFE 104 — "SACI Project" — Report III, February 1970.

LAFE 109 — "Experiment Proposal — Brazilian Educational Radio and TV /2

Experiment on ATS-F," revision dated May 1970.

LAFE 146 — "SACI Project — Progress Review Meeting

February 18/10, 1971; revision dated May 1971.

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*Numbers in the margin indicate pagination in the foreign text.

2. Summary description of the SACI Project

The SACI Porject is comprised of 3 segments:

-- Segment 01 -- Experiment ATS-3

-- Segment 02 -- Educational Experiment of Rio Grande do Norte State

-- Segment 03 -- National Coverage System.

2.1. Segment 01 -- Experiment ATS-3

INPE -- Stanford University (USA) link via satellite ATS-3, already in orbit, is for seminars, lectures, classes, etc.

The radio transceiver equipment to be used in this connection has already been installed and has been working experimentally.

Besides this, a slow=scan system will be used which is already installed and functioning through an internal telephone line at the INPE. The connection between the slow-scan system and the radio transceiver equipment is expected on 1/14/1972 and the beginning of complete operation of Experiment ATS-3 is due on 2/11/1972.

2.2. Segment 02 -- Educational Experiment of Rio Grande do Norte State /3

Formerly called "Experiment ATS-F," due to the fact that it was conceived to utilize NASA's ATS-F satellite, to be launched in 1973. As the experiment enlarged its goals, the ATS-F satellite took on a complementary but not essential role. As NASA has not yet set a date for the signature of the agreement, Segment 02 has come to be called Educational Experiment of Rio Grande do Norte State.

Thus, the Educational Experiment of Rio Grande do Norte State is intended primarily to broadcast educational programs, through audiovisual means, to approximately 500 municipal and state elementary schools of Rio Grande do Norte State, and evaluate the results. Local radio broadcasting stations, television transmitters and relays and, possibly, the ATS-F and/or ATS-G satellites will be used.

2.3. Segment 03 -- National Coverage System

If approved by the government, nationwide broadcasting will be conducted through a Brazilian satellite as proposed in the document LAFE-165 of INPE.

This report covers the 3 segments mentioned above. It emphasizes, however, Segment 02. Thus, the activities and information reported refer to the Educational Experiment of Rio Grande do Norte State, unless the contrary is clearly indicated.

3. Structure of the SACI Project

As mentioned before, the Educational Experiment of Rio Grande do Norte State has expanded its aims and has been divided into Missions, as follows:

Mission 1972
Mission 1973
Mission 1974
Mission 1975.

The basis for naming the above missions was to identify the mission by the corresponding year of its operational phase. Thus, the operational phase of Mission 1972 will be during the year 1972, etc.

Summarizing, the missions propose to provide:

Mission 1972 -- a. Supervisor and teacher training
b. Course for preparation of lay teachers -- primary level.

Mission 1973 -- a. Supervisor and teacher training
b. Course for preparation of lay teachers -- secondary level
c. Primary teaching -- 1st and 2nd years.

Mission 1974 -- a. Supervisor and teacher training
b. Course for preparation of lay teachers -- high school.
c. Primary teaching -- 1st, 2nd, 3rd and 4th years. /5

Mission 1975 -- a. Supervisor and teacher training

b. Course to bring primary-level teachers up to date

c. Primary teaching -- 1st, 2d, 3d and 4th years.

These missions are explained in detail in a subsequent chapter.

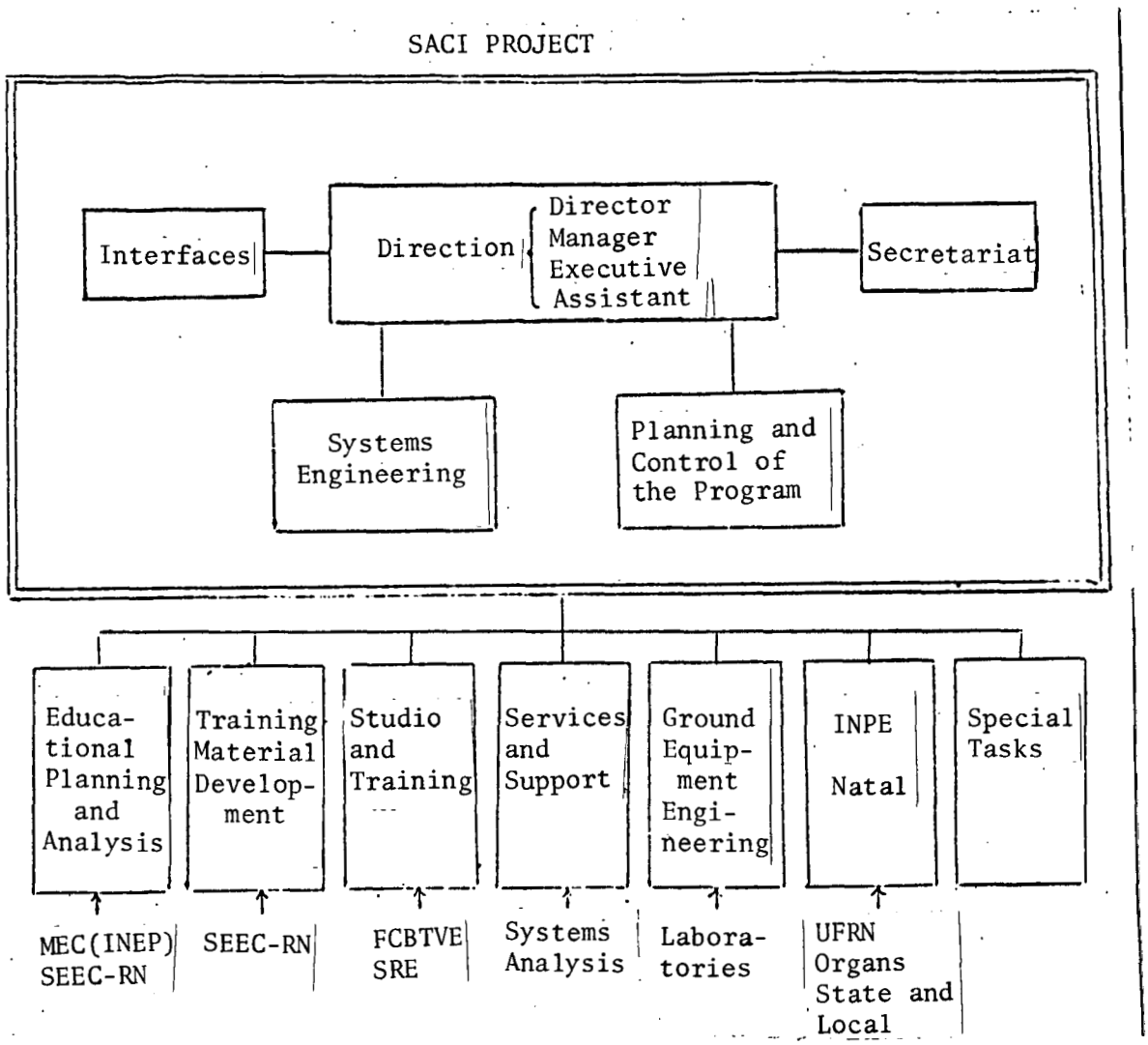
Each mission was divided into 6 phases in order to supplement the previous one.

1. Planning
2. Development
3. Production
4. Pre-Operation
5. Operation
6. Termination

In Report LAFE-146, phase 6 -- Termination -- was called "Evaluation." The change was made because there is continuous evaluation of the experiment through all phases, not only at the end. It is, therefore, understood that there are activities related to evaluation in each of the 6 phases.

The activities to be performed in each one of the phases described above, for each of the Missions, were specified in the Work Flow Diagram (DFT), mentioned in LAFE-146. This diagram was properly adapted and brought up-to-date to allow for the restructuring of Segment 02, mentioned above.

However, the organogram of the project which was made based on the old DFT did not need to be altered; it is as follows: /6



The basic functions that each one of the groups on the previous diagram must provide suffered some modifications from LAFE-146 on, that is: /7

a. The Group for Development of Material and Training, besides the functions mentioned in LAFE-146, is also responsible for the preparation of the plans, scripts and accompanying material for each one of the TV and radio classes.

b. The Group for Ground Equipment Engineering, besides the functions mentioned in LAFE-146, participates in the development of a prototype of a

direct reception station for signals emitted by the Brazilian satellite corresponding to Segment 03, National Coverage System. This development is being made in accordance with the Laboratory Division of the INPE.

This same group is also responsible for the preparation of the work related to Segment 01, Experiment ATS-3.

c. The Special Tasks Group is only responsible for activities related to computation, since the Experiment ATS-3 has been transferred to the direction of the Group for Ground Equipment Engineering.

The other groups not mentioned here retain the same basic functions as in LAFE-146.

4. Objectives of the Educational Experiment of Rio Grande do Norte State /8

The objectives of the Educational Experiment of Rio Grande do Norte State are the following:

4.1. To study on a reduced scale and under controlled conditions, the efficiency of learning by a program of primary level teaching, utilizing audiovisual means, including TV, radio and slow-scan, with reception in schools and active participation of the teachers.

4.2. Provide training for elementary teachers in the utilization of the audiovisual means of the experiment, and, using these means, develop a program for preparation of teachers, evaluating and improving the methods as an essential part of the experiment.

4.3. Verify the acceptance rate of the use of new techniques in the educational system in the area of the experiment.

4.4. Based on a constant evaluation of the results, to develop and improve the teaching program in order to make it suitable to the local needs of the groups involved in the experiment.

4.5. Develop and test approach techniques in order to obtain support and participation of the local society in the realization of the experiment.

4.6. Develop and test electronic equipment (especially that used in space telecommunications), autonomous energy generators and others required by the experiment, mainly those to be used by schools, with emphasis on cost minimization and preference given to national industry [products]. /9

4.7. Develop and test methods and routines for the installation, operation and maintenance of the ground equipment used in the experiment.

4.8. Analyze the results obtained in the area of the experiment, in comparison with the corresponding costs, taking into account the reduced scale of the experiment, and the several types of telecommunication and audiovisual means used.

4.9. To offer better educational opportunities to a considerable fraction of the school-aged population located in the area of the experiment.

4.10. Develop and increase the national industry's capacity for production of the necessary equipment for this type of technological application, particularly in the field of space telecommunications.

4.11. Through a carefully planned and performed evaluation of the experiment in its various aspects, to obtain elements which can be used in a national educational system using advanced technology.

4.12. To develop techniques for TV and radio programming for education in various areas and levels, as well as techniques for learning evaluation.

5. Achievements from February to November 1971 /10

5.1. Documents prepared

-- Characteristics of the Elementary Schools of Rio Grande do Norte State.
-- Characteristics of the Elementary Teachers of Rio Grande do Norte State.
-- Characteristics of the Elementary School Students of Rio Grande do Norte State.
--Preliminary Educational Project.
--Preliminary Specifications of the Educational Project.
Complete Class Plan of Mission 1972.
--Plans of the Programs of Mission 1972 (Part).

-- Scripts of the Programs of Mission 1972 (Part).
-- Accompanying Material of the Programs of Mission 1972 (Part).
-- Proposal for an Advanced System in Educational Technology (5 volumes), in collaboration with the Systems Analysis Center and the Laboratory Division of the INPE.
-- Work plan for the development of a prototype of a direct reception station for Segment 03, in collaboration with the Laboratory Division of the INPE and domestic industry.
-- Preliminary specifications of the development of the prototype mentioned, in collaboration with the Laboratory Division of the INPE.
-- Systems Engineering Manual prepared by the Systems Analysis Center of the INPE with the collaboration of researchers in the SACI Project.
-- Goals of Mission 1972 of Segment 02.

Besides the documents mentioned above, revisions were made in various documents listed on page 20 of LAFE-146: for instance, the General Objectives of the Educational Experiment of Rio Grande do Norte State, etc.

5.2 Training /11

a. 6 (six) participants sent to the USA for a course in Educational Technology at Florida State University. (6/9/1971 to 8/10/1971).

b. Training Course in Educational TV, at the INPE, attended by participants from the INPE, FCBTVE (Foundation Center of Brazilian Educational TV), FEPLAM (Padre Landell de Moura Educational Foundation) and others; taught by members of the INPE and CEDO (Center Educational Development Overseas-England), etc. (1/11/71 to 4/8/71).

c. Course of Production in Educational Radio, at the INPE, with participants from various states and organs, including Brasilia, Rio Grande do Norte, Bahia, São Paulo and the Educational Radio Service of the Ministry of Education and Culture (SRE/MEC). (May and June 1971).

d. One participant sent to Bahia for the IId National Course for Television Producers (October/November 1971).

e. TV Language Course, Professor Irma Abirad (February 1971).

f. Through USAID contribution, 3 Ph.D. candidates in New Educational Technologies sent to Florida State University.

5.3. Meetings and Seminars -- Coordination and/or Participation

Ministry of Education and Culture

a. Seminar on gifted students, by invitation of the Director of the Department of Complementary Teaching of MEC -- Brasilia (10/21 and 22, 1971).

b. Systems Engineering Seminar on Control and Evaluation on Projects for /12
members of the MEC Counciling Office of Control and Evaluation, in collaboration with the Systems Analysis Center of the INPE. (10/11/71 to 10/15/71).

c. Meeting at the General Secretariat of MEC on the creation of a coordinating group for Teleeducation. (8/25,26,27/71).

d. IIId Brazilian Seminar on Educational Radio and TV, sponsored by the FCBTVE, the International Solidarity Institute of the Konrad Adenauer Foundation and Maranhense TVE Foundation. (7/11 to 18, 1971).

e. First National Conference on Technology of Education applied to higher education, sponsored by the Council of Brazilian Universities, Rio de Janeiro (6/14 to 19, 1971).

f. Seminar on Educational Technologies and Teacher Training, Salvador, Bahia (5/26 to 29, 1971).

g. Course in Pedagogical Improvement, sponsored by PUC/RS in cooperation with SUDESUL (November, 12 to 12, 1971). Porto Alegre.

Ministry of Communications

h. CCIR Special Joint Meeting, in preparation for the World Administrative Radio Conference, Geneva, Switzerland, as part of the Brazilian Delegation. (February 1971).

i. Meetings in the Technical Sector of the General Secretariat of the /13
Ministry of Communications to study the position to be taken by the

Brazilian Delegation at the World Administrative Radio Conference. (March to June, 1971).

j. World Administrative Radio Conference -- Space Telecommunications -- as part of the Brazilian Delegation. (Geneva, Switzerland, June-July, 1971).

k. Meetings in the Technical Sector of the General Secretariat for adaptation of the Brazilian telecommunications regulations to the deliberations of the World Administrative Radio Conference. (since August 1971).

l. Convention of the National Cable-Television Association of the USA (Washington, July, 1971).

5.4. Recorded Classes

-- During course CEDO/INPE -- 13 programs of 1 minute, 15 programs of 5 minutes, 31 programs of 10 minutes and 19 programs of 20 minutes.

-- During Professor Irma's course, 10 programs of 10 minutes.

-- After the courses, in the experimental phase, 38 programs of 10 to 15 minutes.

-- In the final phase, 18 programs until the end of October, 1971, and about one program per day in November 1971.

5.5. Goals achieved /14

The achieved goals listed here refer to the Short Term Plans, listed on page 24 and LAFE-146.

-- Survey of the characteristics of the teachers, students and schools to be involved in the Educational Experiment of Rio Grande do Norte State.

-- Pre-test of the questionnaire to be used in the survey of the local leadership in Rio Grande do Norte State.

-- Initiation of the equipment development.

-- Initiation of the INPE/Stanford link, via Satellite ATS-3.

-- Preparation of the studies of system integration via satellite and surface (Proposal for an Advanced System of Educational Technology, 5 volumes).

-- Initiation of planning for implementation of the National Coverage System (Segment 03).

-- Search for location to begin installation of an economically feasible community.

The beginning of the course for preparation of lay teachers (primary level) was postponed until 1972, due to the restructuring of Segment 02.

With regard to the expansion of the pilot studio, the final corresponding studies are being concluded and the expansion mentioned will be ready before the end of the current year.

6. Short, Medium and Long-Term Plans /15

6.1. Short Term -- 1972

-- Initiation of the course for preparation of teachers.

-- Continuation of the development of ground equipment for utilization with a satellite (Segment 03).

-- Initiation of the production of classes for Mission 1973.

-- Initiation of the evaluation of Mission 1972.

-- Activation of the plans in Segment 03, National Coverage System.

-- Survey of the local leadership of Rio Grande do Norte State, to be involved in Segment 02.

-- Termination of the production of classes for Mission 1972.

-- Improvement of the plans for utilization of combined resources for the experiment.

-- Begin implementation of the first economically feasible community.

6.2. Medium Term -- 1973

-- Initiation of Mission 1973.

-- Continuation of the development of equipment for Segment 03.

-- Initiation of the production of classes for Mission 1974.

-- Termination of the production of classes for Mission 1973.

-- Consolidation of the economically feasible community.

6.3. Long Term

1974 -- Continuation of utilization of combined resources for the Project.

1974 -- Termination of the production of classes for Mission 1974.

1975 -- Use of satellite ATS-F. /16

1975 -- Termination of equipment development for Segment 03.

1975 -- Production of equipment for Segment 03.

-- Economically feasible community functioning normally.

1976 -- Initiation of transmission by the National Coverage System (Segment 03).

Note: The plans presented in this section are on a general level. There are others, more detailed, which are presented in subsequent chapters.

CHAPTER II /17

GROUND EQUIPMENT ENGINEERING

This chapter presents, in an integrated form, a resume of the activities and up-to-date information on the strategy in force in the SACI Project, with regard to Equipment Engineering.

The three Segments which constitute the SACI Project are presented here.

1. Proposal for an Advanced System of Educational Technology (S.A.T.E.)

The document "Goals and Bases for Government Action," published by the Office of the President in September 1971, establishes the need for a study of an integrated system of radio and TV, to meet the goals of education for the primary, secondary, high school and college levels, adult literacy and education, technical education and teacher training, reaching rural areas and the most remote areas of the country. The study of the implementation of this advanced system of educational technology was assigned to the National Research Council of the Interministerial Committee and the INPE was designated to integrate the Technical Coordination Group.

As a partial contribution of the INPE to this study, a report (LAFE-145) was prepared in 5 volumes and submitted to the appreciation of the superior authorities of the government. In this contribution the Group of Equipment Engineering presented a work proposal, estimating the configuration and the costs of a communication system which would utilize a Brazilian geostationary satellite for nationwide transmission of educational radio and TV programs.

In this work proposal 3 carriers frequency-modulated by base bands consisting of both video and audio information would be transmitted in the 2,500 to 2,690 MHz band, which was allocated by the World Administrative Radio Conference for Space Telecommunications, held in Geneva this year. /18

Two types of receiving station are planned, as shown in Figure 2.1: the direct reception stations, of small size, one installed in each school and indicated for more remote and impoverished places; and the relay stations which

would be more economical for places with populations above 85,000, where ordinary receivers can be used since satellite signals can be transmitted through relay stations.

Table 1 summarizes the figures for these 2 types of stations.

Stations	Number	Schools Reached	Population Reached	% of the Total Population Reached
Direct Reception	108,000	108,000	65 million	62%
Via Relay	130	67,000	40 million	38%

Table 1: Number of Stations.

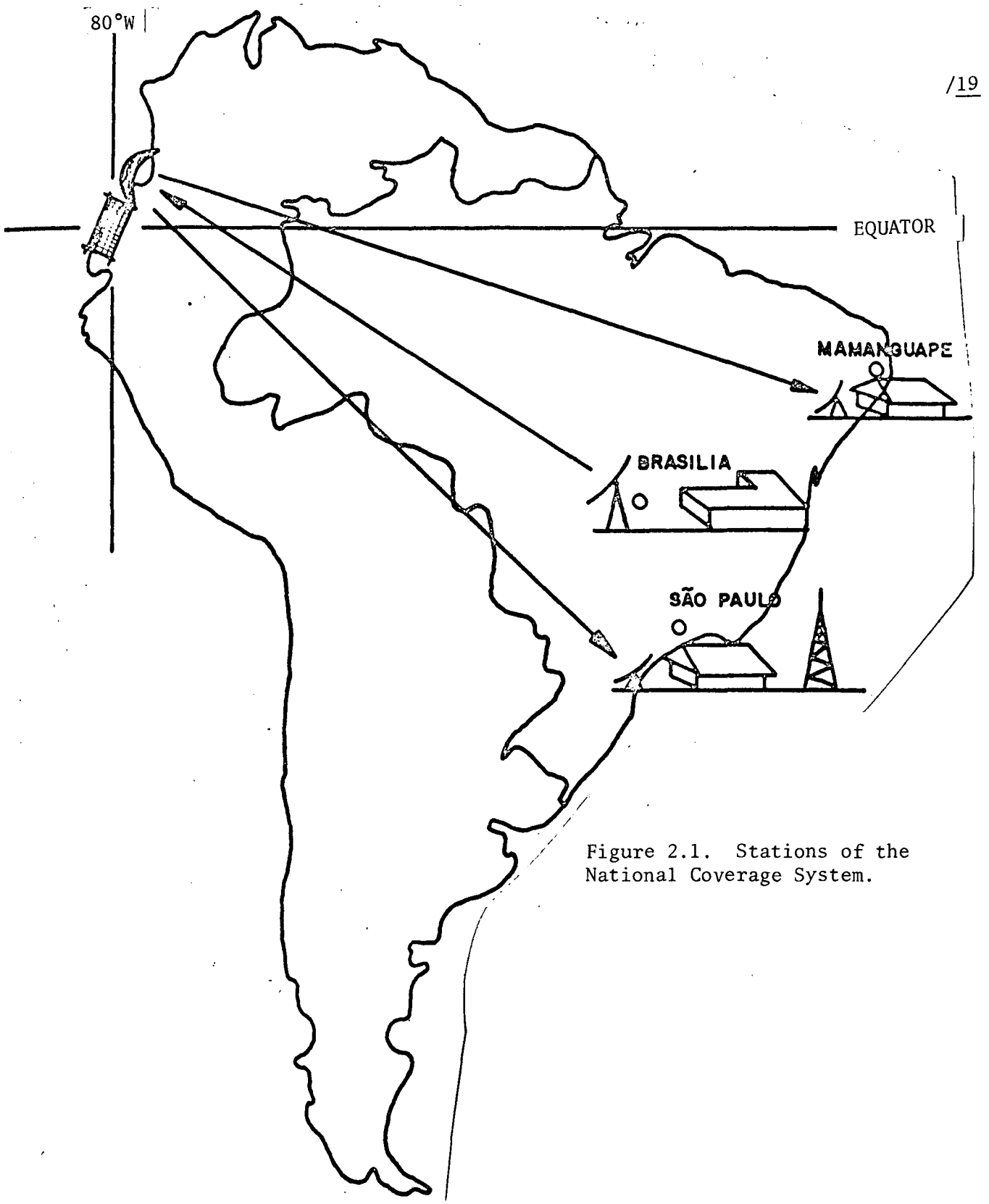


Figure 2.1. Stations of the National Coverage System.

The total amount of investment in the communication system as analyzed /20
came to $160,000,000, 82% representing ground equipment costs, which would be manufactured by national industries. The amortization of this investment, for a 14-year program, including maintenances and operation costs, and would result in an annual cost of $33 million, i.e., $1.50 per year per student.

2. Development of the Prototype of a Direct Reception Station for Segment 03

The conclusion of this study was followed by development of a prototype of a direct reception station, which is now in its specification phase. Its block diagram is shown in Figure 2.2; the projects of the electrical and mechanical parts will permit mass production by the national industry which participates in the development of the project .

The antenna will be about 2.5 meters in diameter. We have three different types of this antenna in our laboratory for comparison and tests. The preamplification on low noise level can be done with a transistorized stage, with a noise level of about 6 dB.

Comparison will still be made of the modulated frequency and the delta modulation, which have been the most promising in terms of cost efficiency, for the codification of radio channels to be transmitted to the satellite and received in the schools.

As the direct reception station in development will serve the most remote and impoverished schools, where electricity is often not available, the problem of low cost electricit y generation, for low consumption (about 100 to 150 W) is also being studied.

Various possible sources of electricity have been studied, including /22
technical studies of different systems and preliminary projects for some less conventional methods. National industries were visited to ascertain the availability and cost of the elements included.

The selection of the most promising alternatives is being made; after that, detailed studies will be made and specifications prepared for those alternatives. The projects will then be improved so that the prototypes of the selected sources of electricity can be manufactured by the industries.

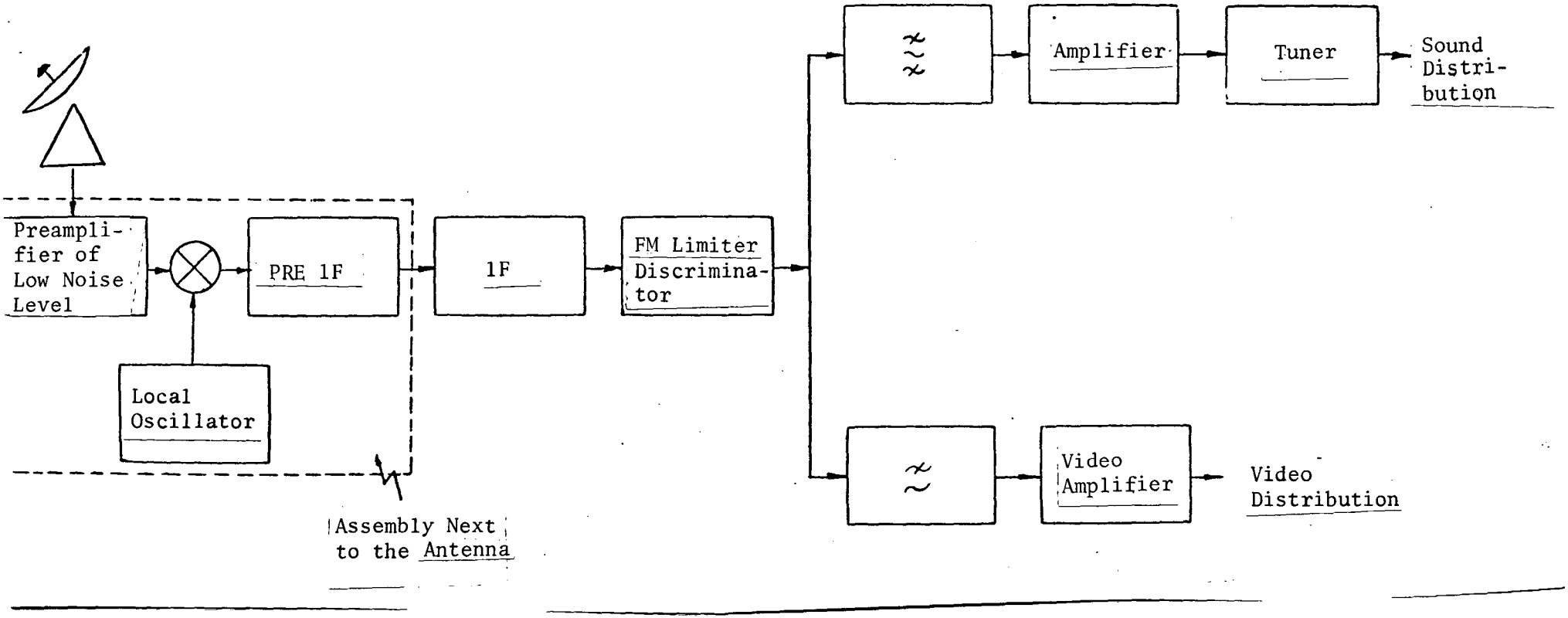


Figure 2.2. Block Diagram of the Prototype under Development.

3. Educational Experiment of Rio Grande do Norte State (Segment 02)

In this experiment, 500 schools of Rio Grande do Norte State, chosen at random, will receive educational programs through radio and TV next year.

For the first 2 or 3 years, the transmission will be made by conventional VHF and medium wave methods. Subsequently, the schools will receive equipment capable of receiving the transmitted signal by a high-power geostationary satellite, possibly the ATS-F or the ATS-G. Before the effective use of such a satellite, its operation will be simulated through the transmission of a signal identical to that transmitted by the satellite.

For the 1972 Mission of this experiment, 3 radio stations will be used; they will be located in Natal, Mossoro and Caico, and TV Channel 5 in Natal, with retransmission through Channel 2, in the interior of the state (Figure 2.3).

We are now studying in connection with the government of Ceara State, /24 the feasibility of the experiment being extended to the Valley of Jaguaribe area in this state.

4. Experiment ATS-3 (Segment 01)

In this experiment in connection with Stanford University, using satellite ATS-3, there will be transmission and reception of seminars, classes, lectures, etc.

In this connection, a VHF transceiver linked to a set of four helical antennas is already installed and under operational test. The experiment will cover:

-- Voice communication.
-- Image communication, the video signal being transmitted by an audio band is already on our premises, with the assembly of the system for the operational phase under preparation. Its block diagram is shown in Figure 2.4. The images received from Stanford will be projected on a special screen 1.80 × 1.80 m, through tele-beam equipment acquired for this purpose.

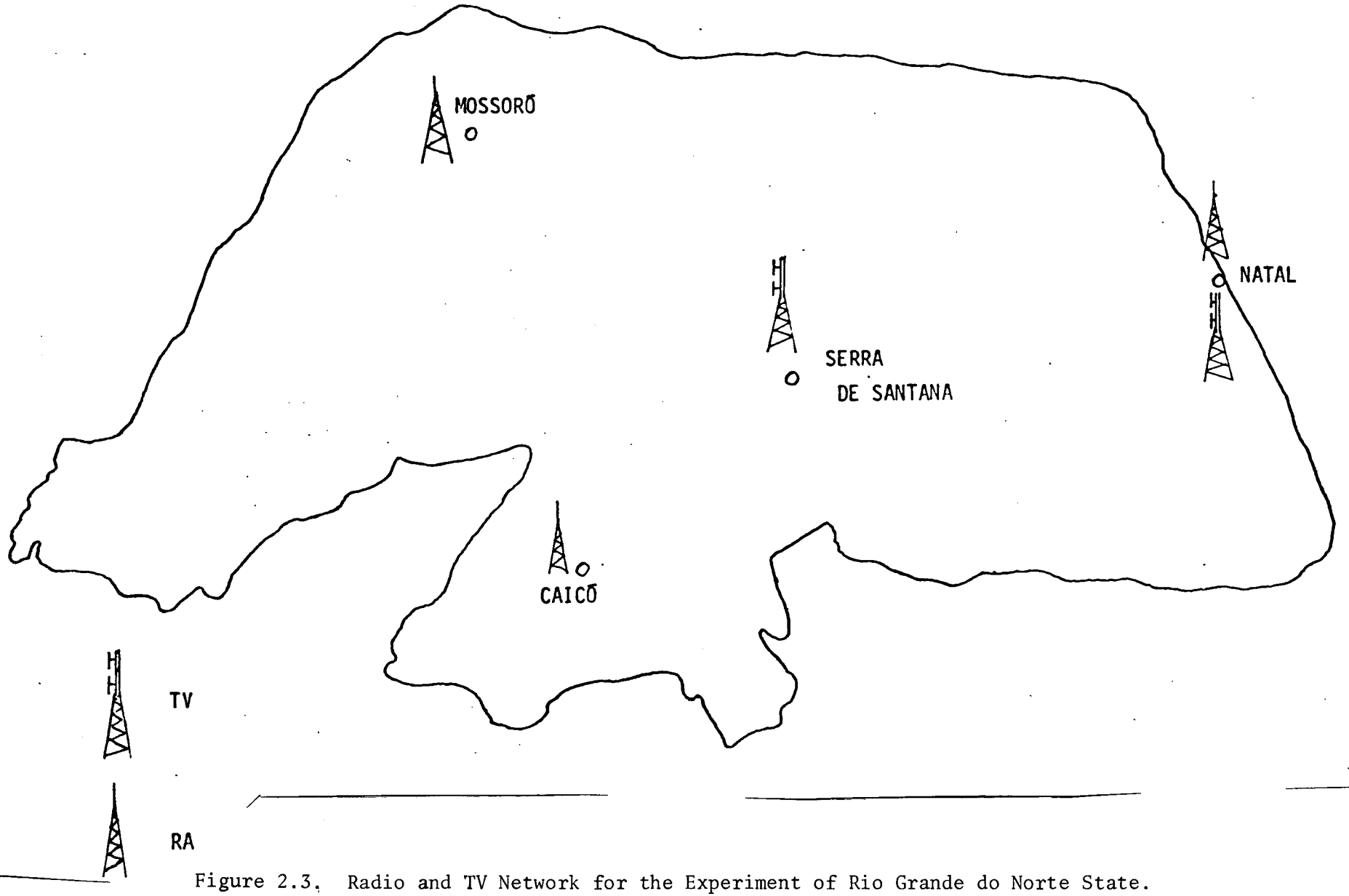


Figure 2.3. Radio and TV Network for the Experiment of Rio Grande do Norte State.

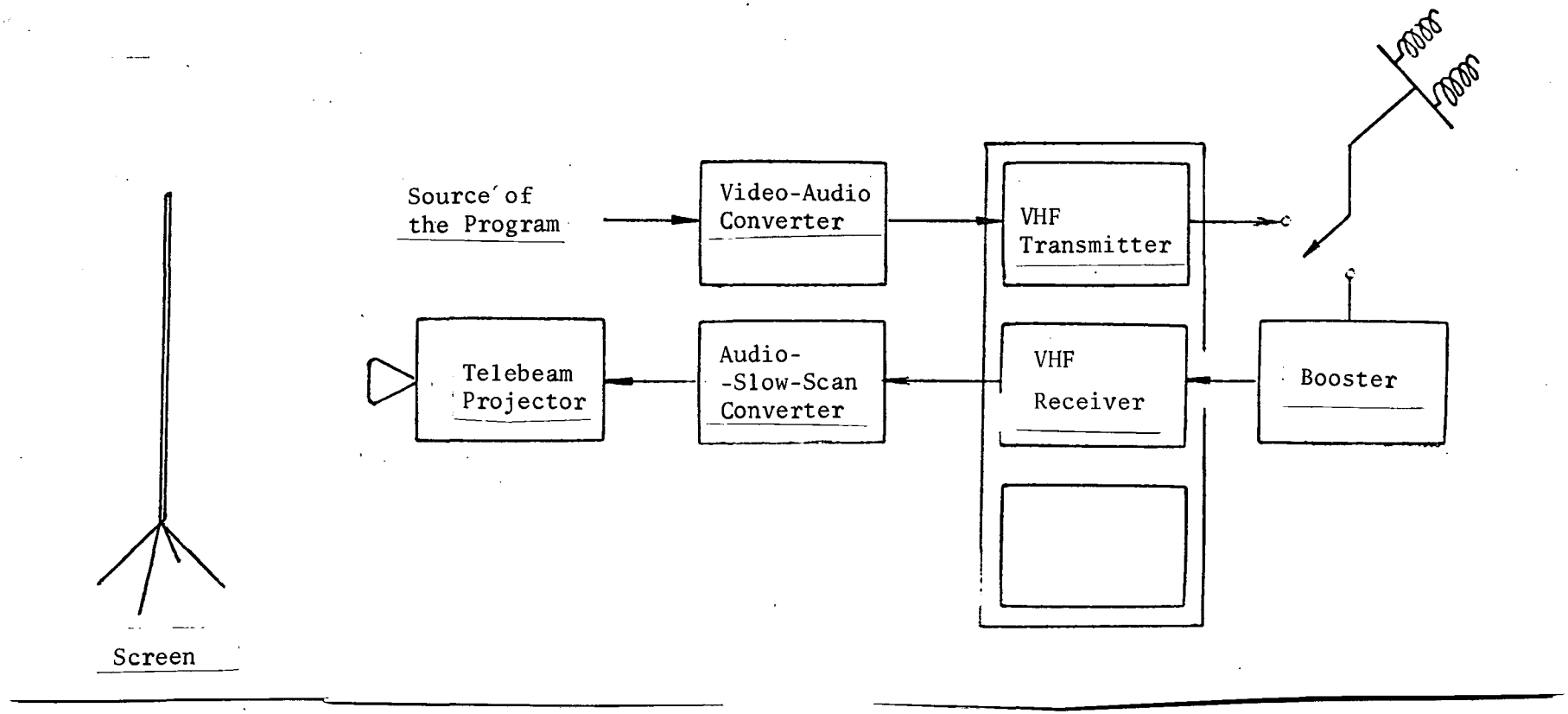


Figure 2.4. Block Diagram of the Equipment for the INPE -- Stanford Connection.

-- The third application refers to the transmission and reception of documents (teledocumentation) through special equipment made by Xerox. This equipment also slow-scans a document which is placed at its input, transmitting the information through an audio channel which is demodulated during reception when the image is reproduced.

CHAPTER III

/26

EDUCATIONAL PROJECT

Resume[1]

This chapter presents the current version of the Educational Project of Segment 02 and replaces the document of the same title presented in LAFE-146 (pp. 61-84).

The subject of this chapter will be as follows:

1. Introduction
   -- Work schedule
   -- Educational goals
   -- Schedule of activities
2. Criteria for Delimitation of the Area of the Experiment
3. Criteria for Selection of Schools
4. Study of the Delimited Area
5. Implementation Model
   5.1. Operational Structure
   5.2. Courses to be Conducted
      -- Supervisor and teacher training
      -- Course for preparation of lay teachers
      -- Course to bring elementary teaching up-to-date
      -- First-grade teaching (first four years)
   5.3. Audiovisual Means and Methods of Utilization

[1]This resume refers to the completed parts; the other parts are in progress with termination expected in the second week of December.

1. Introduction /27

From the hypothesis, presented in several published documents, that the application of technological systems and processes in the educational field will solve some of the most serious educational problems in the country in less time and with less cost than the traditional system, SACI Project, which aims to introduce advanced technological resources to the Brazilian educational system, was founded.

Studies of the feasibility of this project are in the development stage. One of them, the Educational Experiment of Rio Grande do Norte State (SACI/Segment 02), utilizing new educational resources via surface and via satellite, is planned to reach that northeastern Brazilian state, where the differences in the environment present a set of problems peculiar to almost all regions of Brazil, and, therefore, constituting an ideal experimental area for later extension of the system.

The formulation of the work plans for this experiment was limited by the technical resources, time and staff available, without losing sight of the scale of priorities based on the Educational Diagnosis of Rio Grande do Norte State.

Considering that the above limitations do not permit the experiment to reach all educational levels, it was established that the principal and immediate goals would be first-grade teaching (first four years) and the preparation and modernization of primary level teaching.

Basically, the experiment is intended to eliminate some of the causes of problems in the first-grade (first four years) teaching of Rio Grande do Norte State: (1) high percentage of truancy caused by socio-economic and educational conditions of the area and (2) high number of students who fail due to lack of adequacy of the teaching system for the population served.

The preparation of elementary lay teachers will be performed in various /28
levels, taking into consideration the different education levels of the staff: complete and incomplete elementary school; complete and incomplete junior high

school; complete and incomplete rural elementary teaching proficiency course; complete and incomplete high school level; complete and incomplete urban elementary teaching proficiency course. Considering that the teaching deficiency is not only due to the teachers' insufficient backgrounds, but also to the out-of-date didactic techniques, we will provide a course in modern pedagogy to graduate teachers. /

On the basis of the proposed goals, we formulated the following work plans:

1. The system involving technological and educational innovations gives better results, in terms of first-grade (first four years) students' production than the traditional system.

2. The preparation of primary-level lay teachers becomes more efficient through the technological system than through the traditional one.

3. The proposed experiment must reach a higher level of the first-grade (first four years) school-age population with better efficiency than the one reached now with the utilization of the traditional system.

The educational goals of the experiment are:

1. To test, on a reduced scale and under controlled conditions, the efficiency and effectiveness of an educational program for the first four years of primary teaching, using audiovisual means, including TV, radio and slow-scan via surface and via satellite, with reception in schools and active participation of the teachers, for the establishment of a program on a national scale. /29

2. Develop techniques for production of educational TV programs in various areas and levels, and also techniques of evaluation of the teaching-learning process.

3. Train the teachers in the utilization of audiovisual means, and using these means, develop a program for preparation of lay teachers, evaluating and perfecting the methods utilized.

4. Offer better educational opportunities for a considerable part of the local school-age population.

5. Based on a formative evaluation, to develop and improve the teaching program in order to make it suitable for the local needs of the groups involved in the experiment.

6. Analyze the results in terms of cost/benefit and cost/effectiveness comparing them with corresponding data of the traditional system.

7. Verify the acceptance rate of the use of new techniques in the educational system of the area delimited.

Consequently, the project will permit:

1. Location of municipalities which make it possible to obtain data on a wide range of local educational situations for the purpose of extension to other states. /30

2. Accurate and reliable quantification of student achievement through the traditional system and through the technological system to permit comparison of results and evaluation of effectiveness.

3. Implementation of the experiment through the joint action of individuals and public and private entities to obtain local involvement and participation.

4. Adequacy of the educational situation of the state to serve the already defined educational priorities.

The elaboration of this experimental project was based on studies of the local situation on the formulated hypotheses, on the proposed goals, on the requirements of the system to be installed, and above all, on the available resources for action and control.

The experiment will serve the mentioned educational priorities, in the course of a 4-year period, as of 1972. The next table (Figure 3.1) shows the chronogram of the activities to be performed.

As can be inferred from Table 1, the experiment will be developed in 4 stages or missions, starting with a relatively simple experiment in 1972 to

complex experiments in the following years. The implementation in stages aims to facilitate the improvement of the methods and processes utilized, thereby assuring the accomplishment of the proposed goals.

In 1972, according to the teachers' criteria, the program of the Course for Preparation -- Stage I will be transmitted to the students during their school period in order to arouse interest and familiarize them with the system to be implanted in 1973. /32

2. Criteria for Delimitation of the Area of the Experiment

The geographical area to be reached covers 94 of the 150 municipalities of Rio Grande do Norte State, involving 2,053 of the 3,439 public schools existing in the state. In the selection of these municipalities, the following criteria were observed:

1. Involvement of the greatest number of municipalities within a geographically concentrated area, for communication and control.

2. Coverage of urban and rural zones of the coast, intermediate area and interior, for generalization of the results.

3. Inclusion of the greatest number possible of SEEC Regional Nuclei so as to utilize the administrative school system of the state.

4. Inclusion of poles of state development to determine adequacy of the project for the study of economically feasible communities.

5. Involvement of a greater number of schools for a better selection of the experimental and control groups.

6. Technical restrictions of the TV and radio signal ranges.

3. Criteria for Selection of Schools /33

For validation and generalization of the results, the schools to be involved will be selected according to the following criteria:

1. Must belong to the State and/or Municipality Education Public System.

2. Inclusion of the 3 categories of public schools -- Elementary Schools (GE), Elementary United Schools (ER) and Elementary Isolated Schools (EI), of rural and urban zones.

3. Schools selected at random taking into account the existing proportions among the 3 categories -- GE, ER and EI.

4. Sampling no less than 25% of the school population in the area of the experiment.

Considering that the main goal is to test the efficiency and effectiveness of new technologies applied to education, a comparative analysis will be made of the technological system and the traditional one. For this purpose the selected schools involved in the experiment will be classified into 3 groups:

1. Experimental Group, composed of 500 schools selected at random from the 600 already selected. All the teachers with assigned classes in this group of schools will attend the Course for Preparation to be taught starting in 1972. Classes will be conducted in the morning and afternoon will receive lessons by the technological system.

2. Control Group I, composed of 50 schools selected at random. Teachers will also attend the training and the Course for Preparation according to the established criteria for the GExp. Students will not have classes through technological means, but will continue with the traditional system. /34

3. Control Group II, composed of 50 schools also selected at random. Teachers and students will continue under the traditional system without the aid of the treatment offered to the GExp. and GC-I.

4. Study of the Delimited Area

Aiming to make the experimental technological system suitable to the real needs of the region, and obtain the support of the communities involved, our research covers 4 types of survey:

1. Characteristics of the Teachers, aiming to obtain detailed information on their needs, values, areas of interest, educational background, professional experience and personal aspirations, involving the 3 existing categories in the Public Primary School System (fundamental).

2. Characteristics of the Students, aiming to obtain more detailed information on their needs, values, difficulties and personal aspirations.

3. Characteristics of the Schools, aiming to obtain detailed information on its location, administrative dependency, category, type of construction, facilities, quantity and quality of the permanent school material.

4. Community Leadership, aiming at the identification of leadership existent in the area to obtain community support, considering that the participation of persons and/or organizations which retain power or exert influence in the community is of vital importance when a technological innovation is intended to be introduced, mainly in the educational field. /35

The characteristics of the teachers and students were identified using the method of representative sampling. The survey of the characteristics of the schools covers all the schools involved. The community leadership will be identified through the results of opinions expressed in a questionnaire to be submitted to each community.

The instrument used for data collection is the questionnaire of oriented answers for easy computation and statistical interpretation. After the electronic processing of collected data, the analysis and report are made presenting the conclusions obtained.

The results of this research will supply information for:

1. preparation of the didactic program to be transmitted during the experiment;

2. elaboration of the evaluation system to be used during the experiment;

3. modifications and adaptations which may be required in the schools selected for the GExp.;

4. specification of the equipment of TV and radio transmission and reception;

5. involvement of local leadership to divulgate the experiment; /36

6. comparative analysis of the influence of technology on the communities of the area.

Mission	Courses and Training	Modes
1972	1. Supervisor and Teacher Training 2. Course for Preparation of Primary Level Lay Teachers, 1st Stage -- Primary Level	1. Operational Demonstration 2. TV and Radio -- Surface
1973	1. Supervisor and Teacher Training 2. Course for Preparation of Primary Level Lay Teachers, 2d Stage -- Secondary Level 3. Primary Teaching -- 1st and 2d Years	1. Operational Demonstration 2. TV and Radio via Surface 3. TV and Radio via Surface
1974	1. Supervisor and Teacher Training 2. Course for Preparation of Primary Level Lay Teachers, 3d Stage -- Elementary Teaching Proficiency Course 3. 1st Grade Teaching (for Students) -- 1st, 2nd, 3rd and 4th Years	1. Operational Demonstration 2. TV and Radio via Surface 3. TV and Radio via Surface
1975	1. Supervisor and Teacher Training 2. Course to Bring Elementary Teachers Up to Date 3. Primary Teaching -- 1st, 2d, 3d and 4th Years,	1. Operational Demonstration 2. TV and Radio via Surface 3. TV and Radio and SS via Satellite

Figure 3.1.

5. Implementation Model

Considering the stages of the experiment that, for operational effects, will be called Missions, we will describe in this chapter the form in which we expect to accomplish the proposed goals for each mission.

5.1. Operational Structure

In the development of the experiment the organizations existing in the area will be utilized, when possible.

Thus, the implementation and control of the experiment will be conducted within the structure which is presented in Table II (Figure 3.2).

Observations:

1. Ministerial, state and municipal organs will observe the experiment, supplying material and technical assistance that is within their fields to the INPE.

2. The INPE will be in charge of the coordination of the experiment.

3. The local work groups are as follows:

a. Training group -- will prepare the supervisors and teachers for their roles during the experiment.

b. Transmission group -- in charge of the distribution of radio and TV signals.

c. Logistics group -- in charge of transportation, communication and maintenance.

4. The regional supervision will attend the municipalities under a Regional Education Nucleus. The regional supervisors will be designated by the Secretary of Education and Culture of Rio Grande do Norte State and must be, besides graduates, supervision specialists. The main function of the regional supervisors will be to coordinate the municipal supervisors, acting as the linking element between the latter and the INPE.

5. The municipal supervision should have graduate elementary teachers, assigned or not to supervise activities in the state or municipal education system, in the proportion of 10 schools for each one. These supervisors will

work directly in the schools in close contact with teachers and students.

5.2. Courses to be Conducted

We will present initially the chronogram of the courses for the whole period of the experiment (Table III, Figure 3.3) to be followed by details of the structure of each.

A. Supervisor Training (Regional and Municipal)

a. Goals

1. To inform all supervisors of the program to be implemented.
2. Prepare them for their specific functions to be performed during the experiment.
3. Stimulate them for integral participation in the experiment. /40
4. Train them in the manipulation of TV and radio receptors.
5. Train them in the application of work techniques to be used in each stage of the experiment.

b. Duration: 1 (one) week for each training forecasted.

c. Place: Natal.

d. Aspects of the training

Theoretical -- Themes:

1. Educational TV as an agent of development.
2. Technical-pedagogical means in educational TV.
3. Aims and structure of the experiment.
4. Modern concept of supervision.
5. Supervision, control and evaluation.

Practical

1. Utilization of TV and radio receivers.
2. Introduction to the course for preparation of lay teachers via TV and radio.
3. Familiarization with the evaluation instruments.
4. Familiarization with the accompanying material.

TABLE II.

/37

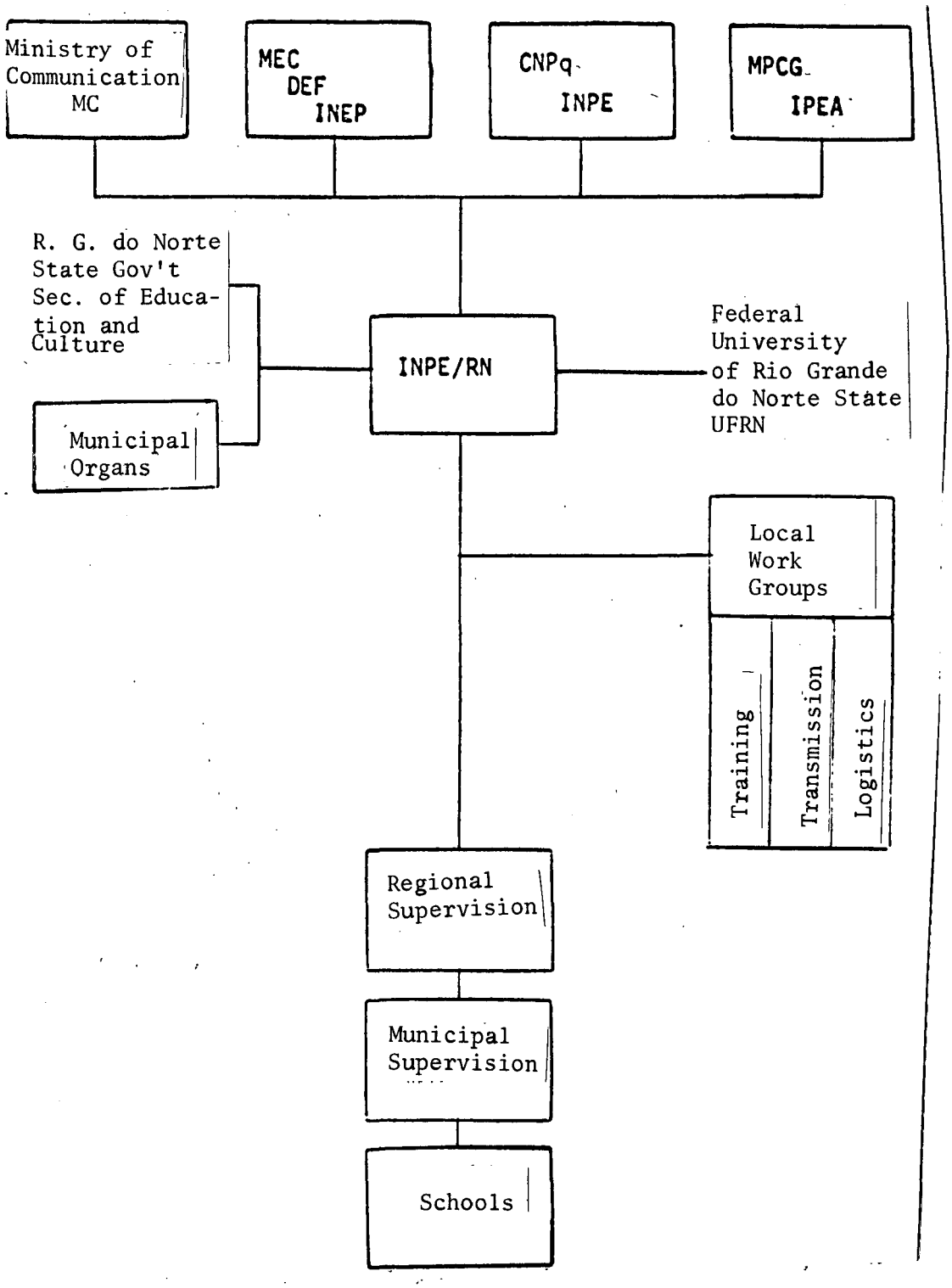


Figure 3.2.

TABLE III.

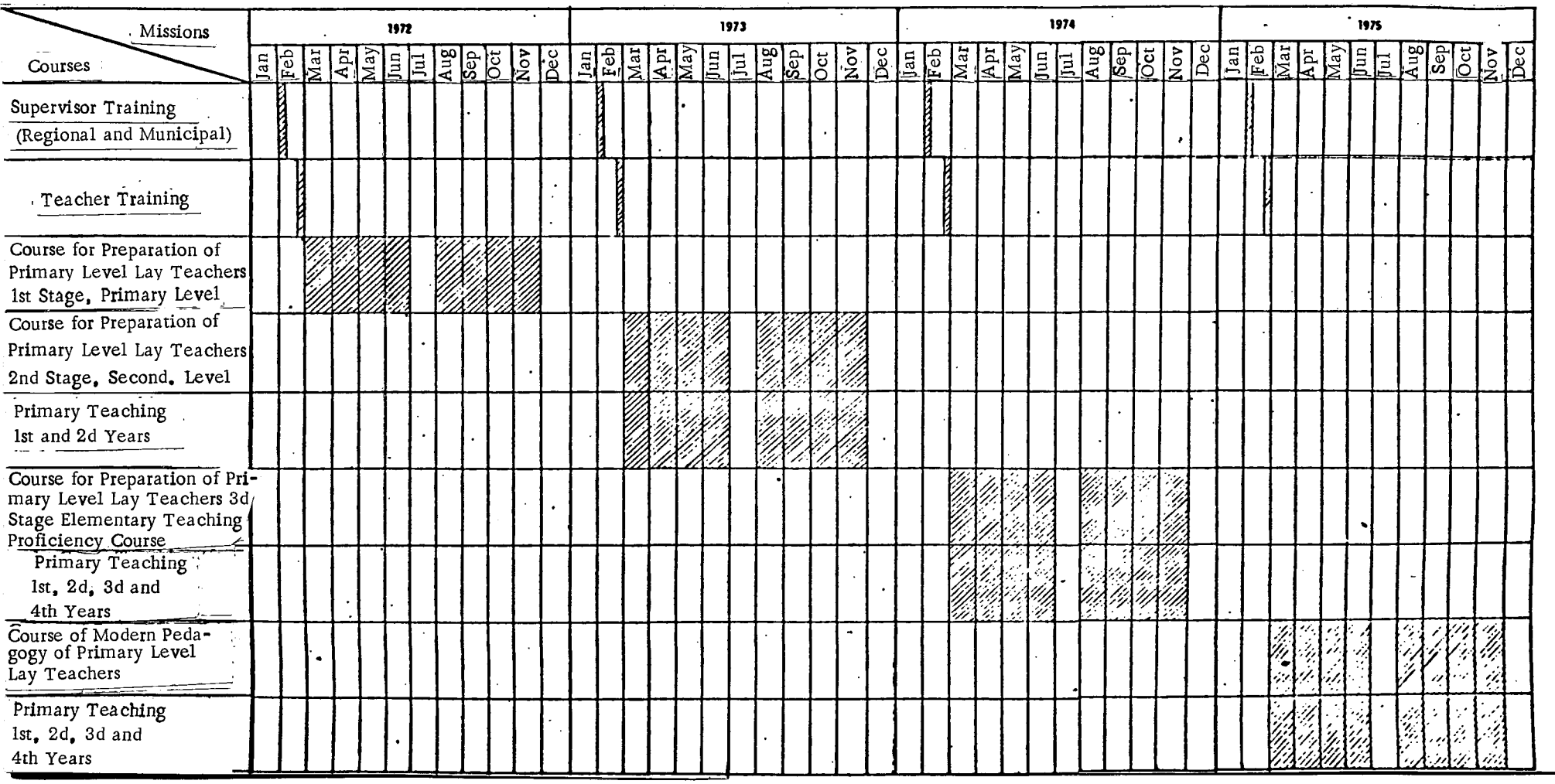

Missions
Courses
1972
1973
1974
1975
Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Supervisor Training (Regional and Municipal)
Teacher Training
Course for Preparation of Primary Level Lay Teachers 1st Stage, Primary Level
Course for Preparation of Primary Level Lay Teachers 2nd Stage, Second. Level
Primary Teaching 1st and 2d Years
Course for Preparation of Primary Level Lay Teachers 3d Stage Elementary Teaching Proficiency Course
Primary Teaching 1st, 2d, 3d and 4th Years
Course of Modern Pedagogy of Primary Level Lay Teachers
Primary Teaching 1st, 2d, 3d and 4th Years

Figure 3.3.

B. Teacher Training /41

a. Goals

1. To acquaint the teachers with the program to be implemented.

2. Stimulate and prepare them for the reception of the course for preparation of elementary lay teachers.

3. Prepare them for the utilization of technological resources and complementary material for primary teaching (first four years).

4. Introduce the scheme of supervision explaining the nature of the relationship supervisor/teacher in the experiment.

5. Instruct them in the use of the evaluation material.

b. Duration: 1 (one) week for each training forecasted.

c. Place: headquarters of the Regional Nuclei

d. Aspects of training

Theoretical -- Themes

1. Goals and structure of the experiment.

2. Utilization of technical-pedagogical resources in educational TV.

3. Importance of the course for preparation of elementary lay teachers.

Practical: /42

1. Operation of TV and radio receivers.

2. Reception of classes on the course for preparation via TV and radio.

3. Familiarization with the accompanying material.

4. Familiarization with the evaluation material.

C. Course for Preparation of Elementary Lay Teachers

First Stage -- Basic education corresponding to the first four years of primary teaching.

a. Goals

1. General: to form and specialize the existent teaching staff which will instruct the primary level in the first four years.

2. Specific: to prepare the primary level lay teachers for the second stage -- secondary level.

b. Participants -- all teachers of the GExp. and of GC-1 of primary level (complete and incomplete).

c. Duration -- from March to November 1972, with 30-day vacation period (July) and daily program of 45 minutes (3 classes of 15 minutes), 5 days per week (3 hours and 45 minutes).

d. Contents /43

1. Portuguese Language
2. Mathematics
3. Social Studies
4. Health and Natural Sciences
5. Civic and Moral Education
6. Pedagogic Notions
7. Didactic Notions

e. Media -- TV and radio via surface

f. Broadcasting schedule

1. TV -- 11:30 a.m. to 12:30 p.m. and 6:30 p.m. to 7:30 p.m.
2. Radio -- 8:00 p.m. to 9:00 p.m.

g. Auxiliary didactic material -- Texts of programmed instruction complementing the classes transmitted by TV and radio.

Second Stage -- Basic education corresponding to the last four years of the primary teaching.

a. Goals

1. General: to form and specialize the existent teaching staff which will instruct the primary level in the first 4 years.

2. Specific: to prepare the junior high school level lay teachers /44
for the third stage in high school level.

b. Participants -- all teachers of the GExp. and of GC-1 of secondary level (complete and incomplete).

c. Duration -- from March to November 1973, with 30-day vacation period (July) and daily program of 45 minutes (3 classes of 15 minutes) 5 days per week (3 hours and 45 minutes).

d. Contents

1. Basic subjects
   -- Portuguese Language
   -- Mathematics
   -- Social Studies
   -- Health and Natural Sciences
   -- Civic and Moral Education

2. Pedagogic orientation
   -- Education Fundaments
   -- General Didactics
   -- Special Didactics of the basic subjects

e. Media -- TV and radio via conventional station

f. Broadcasting schedule

1. TV -- 11:30 a.m. to 12:30 p.m. and 6:30 p.m. to 7:30 p.m.
2. Radio -- 8:00 p.m. to 9:00 p.m.

g. Auxiliary didactic material -- texts of programmed instruction /45
complementing the classes transmitted by TV and radio.

Third Stage: Education of elementary teaching proficiency level corresponding to secondary level.

a. Goals

1. General: to form and specialize the existent teaching staff which will instruct the primary level in the first 4 years.

2. Specific -- to complete the preparation of lay teachers for the high school level, preparing them for the course in Modern Pedagogy.

b. Participants -- all teachers of the GExp. and GC-1 who have not yet completed the high school level of education.

c. Duration -- from March to November 1974, with a period of 30-day vacation (July), and daily program of 45 minutes (3 classes of 15 minutes) 5 days per week (3 hours and 45 minutes).

d. Contents

1. Educational Philosophy
   -- Introduction to Philosophy
   -- Philosophy of Education
   -- Forms and Types of Education
   -- School, Teacher and Student

2. Educational Psychology /46
   -- Concepts, Fields of Study and Limitations
   -- Evolutional Psychology of Children
   -- Psychology of Learning
   -- The Exceptional Child

3. Educational Biology
   -- Introduction to the Study of Biology
   -- Biology Characteristics of Students
   -- School Hygienics
   -- Most Common Diseases Among Students

4. Educational Sociology
   -- Introduction to Sociology
   -- Individual, Group and Society
   -- Culture and Personality
   -- Social Function of the School

5. General Didactics
   -- Pedagogy and Didactics
   -- Process, Teaching and Learning
   -- Didactic Methods, Procedures and Resources
   -- Planning, Orientation and Control of Apprenticeship

6. Portuguese Language
   -- History of the Portuguese Language
   -- Functional Grammar
   -- Didactics of Language
   -- Composition

7. Mathematics
   -- Operations with Sets and Natural Numbers
   -- Sets of Rational Numbers
   -- Systems of Decimal and Non-Decimal Measurement

8. Social Studies /47
   -- Geography and Related Sciences
   -- Earth and Universe
   -- Geography of Brazil
   -- Geography of Rio Grande do Norte State
   -- Nature and Functions of History
   -- Periods of Brazilian History
   -- Rio Grande do Norte State within Brazilian History
   -- Didactics of Social Studies

9. Natural Sciences
   -- Structure and Dynamics of the Subject
   -- Heat -- Fire and Light
   -- Life in Nature
   -- Didactics of Natural Sciences

10. Civic and Moral Education
   -- Religion and Morals
   -- Civic and Moral Formation
   -- Basic Elements of Nationality
   -- Didactics of Civic and Moral Education

e. Media -- TV and radio via conventional station

f. Broadcasting schedule

1. TV -- 11:30 a.m. to 12:30 p.m. and 6:30 p.m. to 7:30 p.m.

2. Radio -- 8:00 p.m. to 9:00 p.m.

g. Auxiliary didactic material

1. Texts of programmed instruction complementing classes transmitted by TV and radio.

2. Selected texts on the subjects taught. /48

D. Course for Modern Pedagogy for Elementary Teachers

a. Goals

1. General: to specialize the existent teaching staff for Primary instruction for students in the first 4 years.

2. Specific: to complete the formation of the participants of the course for preparation and update the knowledge of graduated teachers.

b. Participants -- all teachers of the GExp. and of the GC-1

c. Duration -- from March to November 1975, with 30-day vacation period (July), and daily program of 45 minutes (3 classes of 15 minutes), 5 days per week (3 hours and 45 minutes).

d. Content

1. Educational Philosophy
   -- Pragmatic Education and Existentialist Education
   -- A New Pedagogical Humanism
   -- New School and Traditional School
   -- Education for a Civilization in Transformation

2. Educational Psychology
   -- Evolutional Adolescent Psychology /
   -- Factors which Interfere with Learning / /49

-- Social and Personal Adjustment

-- Educational Measures and Evaluation

3. Educational Biology

-- School and Student Nutrition Needs

-- Teacher Hygiene (Physical and Mental)

-- Installation and Sanitation of the Rural School

-- School Action in the Fight Against Rural Diseases

4. Educational Sociology

-- School Systems

-- The School in the Rural and Urban Environment

-- Influence of Mass Communication Media on the Educational Processes

-- Education as a Factor of Socio-economical Development

5. School Administration

-- General Principles of School Administration

-- General Visions of the School System

-- Elementary School Administration

-- Problems Related to Promotion, Dropping-out, and Repeaters

e. Media -- TV and radio via satellite

f. Broadcasting Schedule

1. TV - 11:30 a.m. to 12:30 p.m. and 6:30 a.m. to 7:30 p.m.

2. Radio -- 8:00 p.m. to 9:00 p.m.

g. Auxiliary didactic material

1. Texts of programmed instruction complementing classes transmitted by TV and radio. /50

2. Selected texts on the subjects taught

E. Primary Teaching (First Four Years)

a. Goals

1. To develop children's reasoning and expression activities

2. Integrate the child in the physical and social environment taking into consideration the democratic tendencies of modern society.

3. Stimulate interest in work and in useful and physical activities promoting the initiation of techniques which meet present and environmental needs.

b. Participants -- 7 to 14-year old children enrolled in the first four years of primary teaching of the GExp. schools.

c. Duration

Alternatives for the determination of the school year.

According to the Chapter I, Article 11 of the law which determines the rules and bases for the primary and junior high school teaching enacted in 8/11/71, by the President, the school year must contain at least "180 effective school working days." Thus, the school period of the experiment can be one of the following alternatives:

Alternative 1 /51

34 weeks with 6 days of activities, total of 204 days. The beginning of the school year would be 2/15 and the end 11/30 with a four-week vacation in July.

Five days would be used for activities via TV and radio and 1 day (Saturdays) for review and/or application of the week's subjects through class exercises, and also development of artistic activities (without TV or radio).

Alternative 2

Same as alternative 1, using TV and radio to transmit cultural programs on Saturdays.

Alternative 3

36 weeks of 5 days of activities with a total of 180 days. The beginning of the school year would be 2/15 and the end between 11/30 and 12/10 (depending on holidays).

d. Content

The programmed instruction will be based on the official program of Rio Grande do Norte State and on the last official deliberations covering 5 subjects or fields of study: Portuguese Language, Mathematics, Natural Sciences and Health, Social Studies and Civic and Moral Education.

e. Media /52

1973 -- TV and radio via conventional means
1974 -- TV and radio via conventional means
1975 -- TV and radio and slow-scan via satellite

f. Auxiliary didactic material

-- Texts of programmed instruction complementing classes transmitted by TV and radio
-- Teacher's manual
-- Exercise book

5.3. Audiovisual Means and Methods of Utilization

a) For Primary Teaching (first four years)

For the accomplishment of the goals of the experiment, the following technological resources are available:

Television (TV) -- via conventional means and via satellite
Radio (RA) -- via conventional means and via satellite
Slow-scan (SS) -- via satellite
Facsimile (FS) -- via satellite.

For future utilization of these means on a national scale, various alternatives will be tested in the c ourse of the experiment specially considering the pedagogical activities and technical restrictions of engineering. These means will be tested separately or through a combination of two for the same school population.

Based on these possibilities the schools of the GExp. will be divided into subgroups according to the audiovisual means utilized, as follows: /53

TABLE IV.

1973			1974			1975		
Subgroups	No. of Schools	%	Subgroups	No. of Schools	%	Subgroups	No. of Schools	%
Radio	100	20	Radio	100	20	Radio	100	20
Radio	100	20	Radio	100	20	RP	100	20
TV	100	20	TV	100	20	TV	100	20
TV	100	20	TV	100	20	TV and RP	95	19
TV and Radio	100	20	TV and Radio	100	20	SS	10	2
						TV and Radio	95	19
Total	500	100	--	500	100	--	500	100

Figure 3.4.

As shown on Table IV, we will have in 1973 and 1974 2 subgroups (Figure 3.4) with TV and 2 with radio, so that in 1975, with the utilization of the satellite and technological resources, we will have subgroups of schools in almost identical proportions.

The different percentages of the 3 subgroups in 1975 is caused /54
by the experiment with slow-scan, whose equipment is rather sophisticated and so restricts its use to only 10 schools, a number supposed to be sufficient for a test of its possible educational application. It seemed better to subtract these schools from the subgroups in which a combination of methods will be used, keeping in similar proportions the subgroups which utilize separate methods.

The combination of media in the subgroups of TV and RP and TV and radio will be performed to utilize the programming prepared for the subgroups in which these means will be utilized separately. The adequacy of the subjects of one discipline to the media will determine the programs to be transmitted by radio or TV, according to the modern principles of selection of means of tele-education.

b) For the Courses for Preparation and Modern Pedagogy for Teachers

For the 3 stages of the Course for Preparation of Elementary Lay Teachers (1972, 1973 and 1974) TV and radio via conventional means will be used. The teachers of the Gexp. will be distributed in the subgroups already established for the implantation of the technological system in the primary teaching (first four years) starting in 1973.

The Course of Modern Pedagogy for Elementary Teachers (1975) will be transmitted by TV and radio via satellite. The teachers will continue in the same subgroups of the Course for Preparation.

CHAPTER IV

/55

DIDACTIC PROGRAMMING

General Considerations

In this chapter, all aspects related to Didactic Programs are considered. However, within the progressive detail approach already mentioned, we shall emphasize here the most general topics of the Didactic Programming, such as control of production and quality, organization, progress, etc. The pedagogic and communication aspects will be considered in the next chapter.

Chapter IV will cover evaluation, but only as it is related to accompanying material, from the point of view of data processing. The pedagogic aspects of evaluation are the object of a more detailed study in Chapter IV.

1. General Progress for the 1972 Mission

At the time of the preparation of the last report (LAFE-146, February 1971), the Production of Didactic Programming of the SACI Project was half-way through its training phase. The curriculum was being analyzed, its distribution for TV, radio and accompanying material was being considered, and the proper method of evaluation and the corresponding tests were being examined.

As to the production, the studio staff was being trained in the use of /56
the equipment, in the production and realization of short programs (about 1 minute) and in the basic notions of continuity and rhythm on TV. As part of formation, a substantial number of programs was prepared and analyzed.

In the last stage of the training phase of the studio staff, the production and realization of programs of duration between 10 and 13 minutes was initiated, the actual duration to be used in the SACI Project. After the training, the experimental production of scripts was tested. Up to this point the pedagogues and the writers were separated, physically and organizationally. In September of this year we found out that it would be more appropriate to have all pedagogues and writers together within the Development of Material and Training Group (DMT) forming groups of production. Each pedagogic area

(Portuguese Language, Mathematics, Sciences, Social Studies, Pedagogic Notions, Civic and Moral Education and Didactic Notions) came under the responsibility of a production group (composed of 3 or 4 persons).

The members of each group were located in the same room, reporting to the leader of the Development of Material and Training Group. As an immediate consequence there was an improvement in the quality of the scripts and of the accompanying material, a speeding up of the recording rhythm, reaching the present rate of one program per day. At the beginning of October, we reached the production of 2 scripts per area per week, which corresponds to two scripts per day. /57

After a series of experiments for the preparation of the accompanying material, a new format patented by the INPE was used. This format, which is discussed in more detail in subsequent chapters, will provide to the lay teachers supplementary instruction directly connected to the program content and divided so as to minimize their homework. The system will provide to each student (in this case, lay teachers) a total of approximately 10,000 answers, to check if the student (lay teacher) is assimilating day by day, subject by subject, the information which is contained in the accompanying material presented. Also, to check the learning through TV and radio programs, the system will provide a total of 500 questions to the student (lay teacher).

All these data will be automatically processed and documented through a computer. The computer program to prepare and store this information was elaborated and tested in a separate experiment.

Now the training phase has finished, and based on the experience obtained, some revisions were made in the organization, as was already mentioned. Also, the specific tasks and chronograms to measure the quality and the quantity of all the components of the system were implemented and are in operation. This will be presented in Section 3.

The present organization for production of the didactic programming is shown in the following section. /58

2. Organization for Production of Didactic Programming

2.1 Composition of the Development of Material and Training Group (GDMT)

Area Supervisors (Graduates in Pedagogy, Social Studies, Agronomy, etc.)

TV Writers (Graduates in Communication, Pedagogy, Social Studies, etc.)

Radio Writers (Graduates in Communication, Arts and Letters, etc.)

The GDMT is divided into groups, each group being responsible for the material of one area (Plan of Program, TV Script, Radio Script and Accompanying Material). Even though the material is produced by the group, the responsibilities are as follows:

Plan of Program -- All groups
TV Script -- TV Writers
Radio Script -- Radio Writers
Accompanying Material -- Area Supervisors.

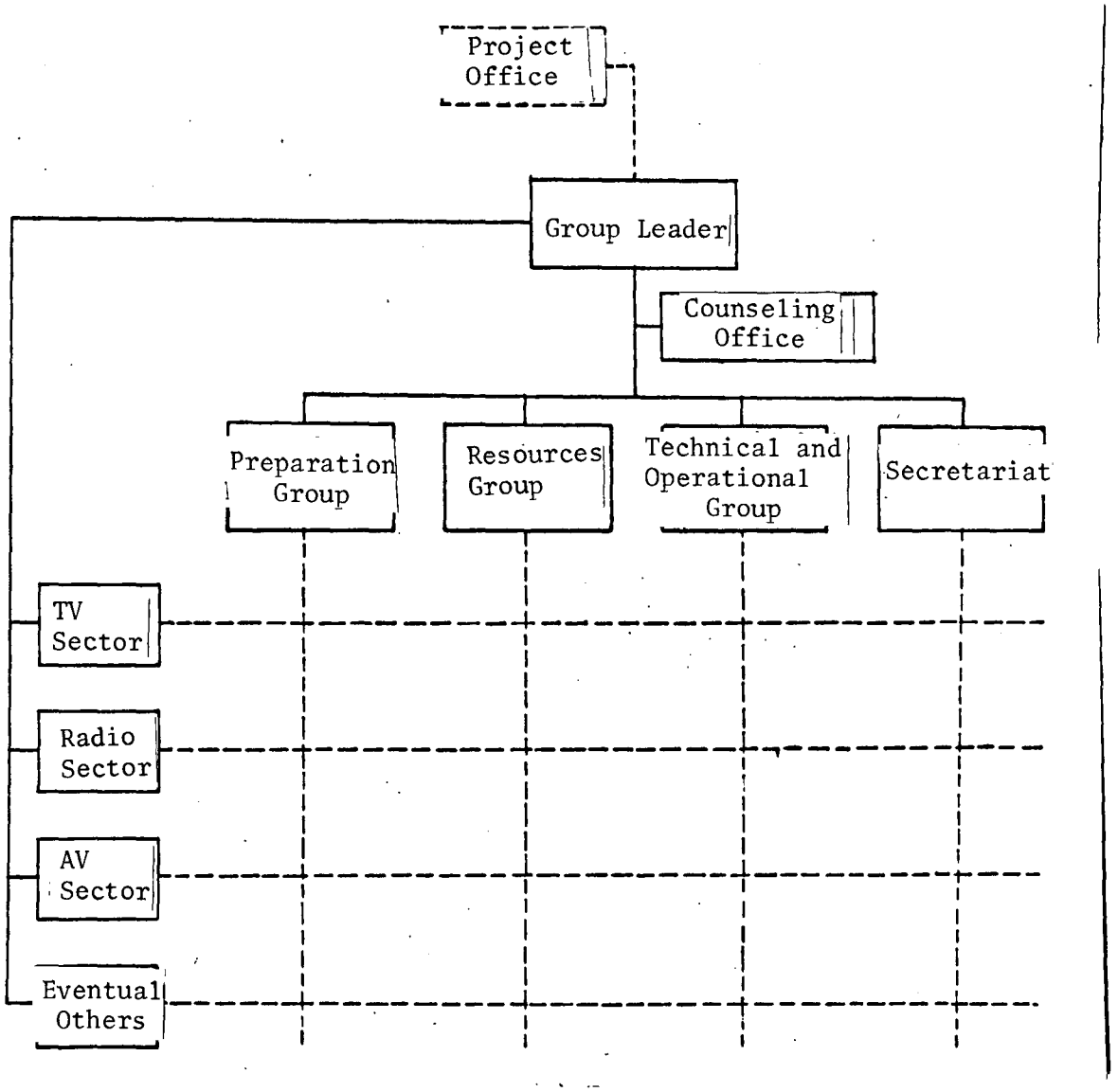
2.2. Composition of the Studio and Training Group (GET)

Composition -- The GET acts in the TV, radio and audiovisual sectors utilizing the following joint means:

Preparation Group
Technical and Operational Group
Resources Group
Counseling Office
Secretariat.

The composition of the audiovisual, TV and radio sectors starting with /59
the groups is shown here, by a matrix on the level of the GET, as one example of the Line Organization which is used in the INPE; the composition of sectors, unifying elements from each group to accomplish one specific goal, allows us to consider the TV, radio and audiovisual sectors, etc., as "target agencies."

Matrix on the Level of the GET



Qualitative composition of the GET - Besides the Group leader, Counseling Group and Secretariat, there are TV, Radio and Audio-Visual coordinators who coordinate the actions (in their respective sectors) of the elements of the "Preparation," "Resources," and "Technical and Operational" Groups. These, in turn, have the following composition:

-- Preparation Group
  Preparers
-- Resources Group
  Media Coordinator
  Traffic Assistant
  Actors
  Graphic artists
  Scenery designer
  Cinematographer-director
  Photographer
  Sound technician
  Sound-effects man
  Studio Assistant
-- Technical and Operational Group
  Technical supervisor
  Cameramen
  Videoman
  VT man
  TC man
  Light man
  Sound man
  Maintenance technician

3. Control of Production and Quality of the Didactic Programming /61

Figure 4.1.a and 4.1.b. show the expected production and consumption of TV and Radio programs. An analysis of Figure 4.1.a. shows that we will have a margin of at least two months in the supply of programs in order to avoid possible delay in production. Note that a supply of 4 to 6 weeks of programs is normal in the TV sector.

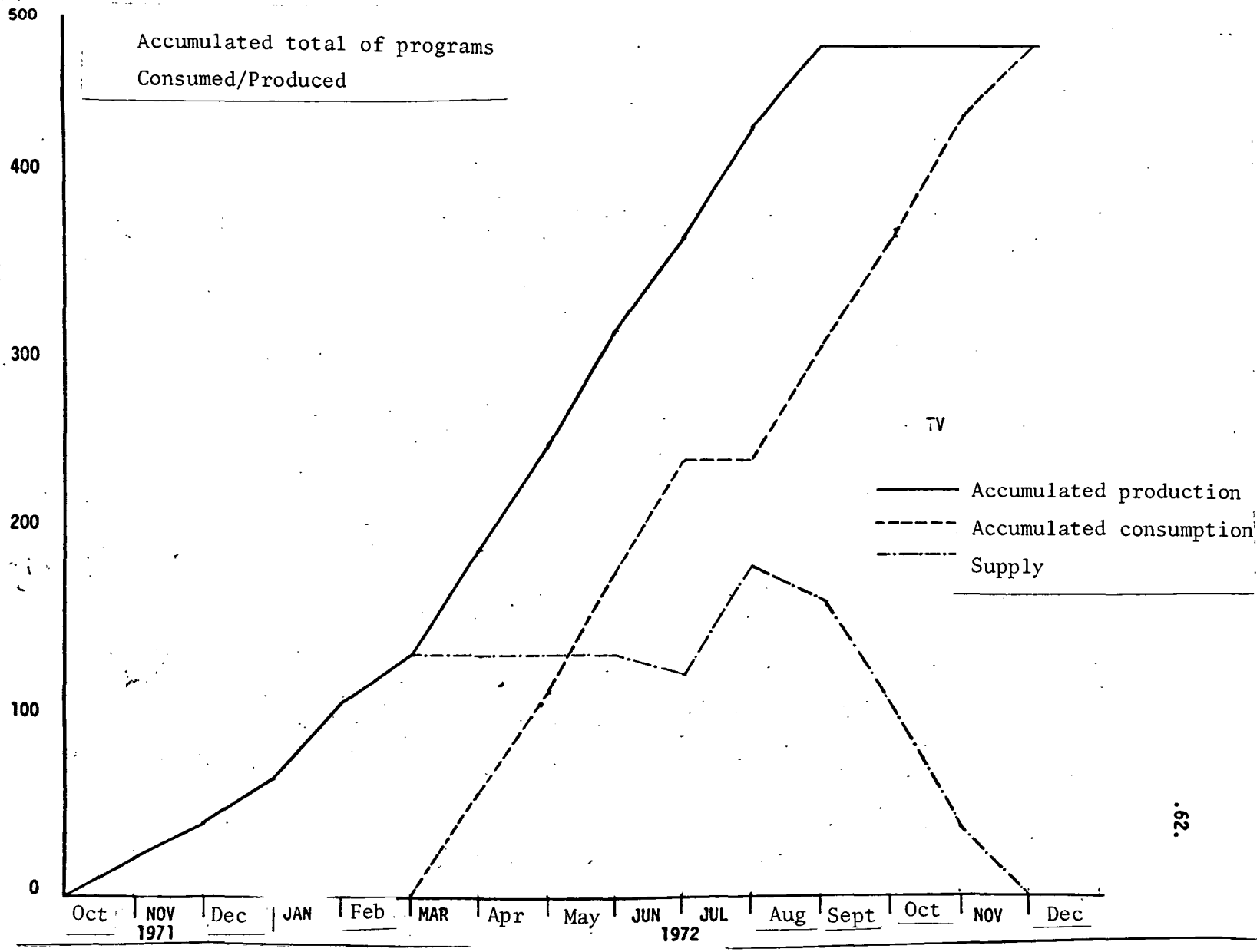

Accumulated total of programs
Consumed/Produced
500
400
300
200
100
0
TV
Accumulated production
Accumulated consumption
Supply
Oct
NOV
1971
Dec
JAN
Feb
MAR
Apr
May
JUN
JUL
1972
Aug
Sept
Oct
NOV
Dec

Figure 4.1.a

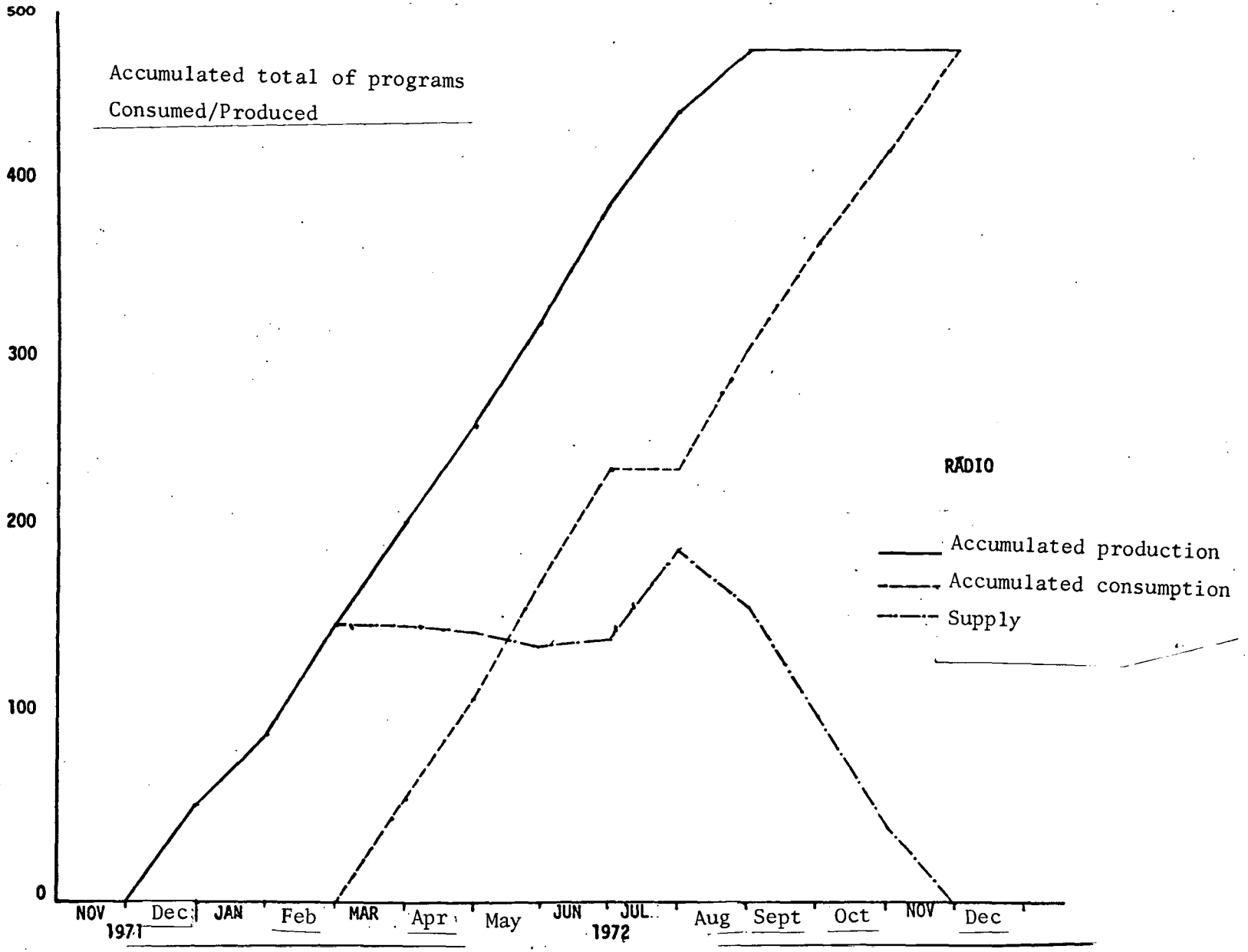

500
400
300
200
100
0
Accumulated total of programs
Consumed/Produced
RADIO
Accumulated production
Accumulated consumption
Supply
NOV
Dec
JAN
Feb
MAR
Apr
May
JUN
JUL
Aug
Sept
Oct
NOV
Dec
1971
1972

Figure 4.1.b

The schedule of TV production is divided into phases, beginning with one program per day (which is being accomplished regularly) and increasing to 2 programs per day, and finally reaching 3 programs recorded per day.

Since the last report (LAFE-146), as the project approached its production phase, various control systems have been studied to assure that the required quantities and qualities of the programs would be reached. The system which has been adopted is still experimental and subject to future changes. It aims to establish clearly the responsibilities of various tasks in the various components of production: TV, Radio, Accompanying Material, Evaluation, etc.

The production of Didactic Programming of the SACI Project covers:
--the creation of the Program Plans according to the state curriculum.
--the production of TV and Radio scripts and its consequent transformation into programs recorded on audio and video tapes.
--the elaboration of the combined material of Programmed Instruction and Evaluation, for later publication.

Each one of these items will be discussed in detail in the following chapters.

The total production schedule of the didactic programming is shown in Figure 4.2[2]. The block closer to the left is the Rio Grande do Norte State curriculum and it is the initial document for the preparation of the Program Plan. /64

The Arabic numerals of the flow chart are points of reference to the chronogram of activities, whose model appears on Figure 4.3. It shows all activities required for the accomplishment of the complete set composed of the items mentioned above (Program Plan, Script and Accompanying Material). The Production groups can relate their schedules to the flow chart and see not only which activity will be performed on a certain day, but also from whom they will receive the material needed and to whom they must submit the material prepared.

[2] [Note: on p. 66 of foreign text, which is missing.]

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Returning to Figure 4.2, the flow chart shows letters inside the circles (A), (B), (C), etc. They represent feedback points in case a task is not approved by the quality control. This quality control is represented by diamonds, identified by a letter followed by a number "D"...inside. This symbol indicates the person responsible for the decision at this point.

As an example, starting on the left side, the preparation of a Program Plan by the Sciences Group, one of the areas for which there is a production group, is initiated by the Rio Grande do Norte State curriculum as a source--document. As he completes the Program Plan, the pedagogue submits it, on the date shown in the schedule of Figure 4.3, to the first quality control point, D1 in the flow chart; if it is accepted, it is labeled as shown in the flow chart and sent to the writer group, as an input document for them. If it is not accepted and needs revision, the Program Plan is sent back to the groups for reworking.

The critical points of quality control and the criteria established in /65
Figure 4.2 are:

1. D1 - For the Program Plan conformity with State curriculum; coherent, adequate and correct contents.

Adequacy of the behavioral or instructional objectives for preparation of the TV and Radio scripts and Accompanying Material. Validity of Evaluation Items if applicable.

2. D2 and D7 - For TV and Radio scripts, respectively:

Adequate format for the program

Balance between instructional and motivational material,

Rhythm

Program Plan adequately transformed according to media capability.

3. D3 - For Accompanying Material in programmed instruction and evaluation material

Agreement with TV and Radio program

All criteria of Programmed Instruction, validity of Evaluation Items.

4. D5 - For Accompanying Material delivered by the publisher.

Agreement with the material sent by the INPE.

Program for Production of Instructional Material

Month .....

Week ..... a .....

	Monday	Tuesday	Wednesday	Thursday	Friday
Pedagogic Notions	① PPP ②	② ESA ③	③ RPS ④	① PPP ②	② ESA ③
	⑤ PPE e	② IMA ③	③ CMA ⑥	② IMA ③	③ RPS ④
	OBS.:	OBS.:	OBS.:	③ CMA ⑥	
				OBS.:	OBS.:
Sciences	ESA ③	① PPP ②	② ESA ③	③ RPS	PPP ②
	③ RPS ④	⑤ PPE e	② IMA ③	④ ①	② ESA
	IMA ③ ③ CMA ⑥	OBS.:	OBS.:	③ CMA ⑥	② IMA 3
	OBS.:			OBS.:	OBS.:
Portuguese	PPP ②	ESA ③	① PPP ②	② ESA ③	③ RPS
	②	③ RPS ④	⑤ PPE e	② IMA ③	④ ① PPP
	② IMA	③ ③ CMA ⑥	OBS.:	OBS.:	3 CMA 6
	OBS.:	OBS.:			OBS.:
Social Studies	③ RPS	PPP ②	ESA ③	① PPP ②	② ESA ③
	④ ①	②	③ RPS ④	⑤ PPE e	② IMA ③
	3 CMA ⑥	② IMA	③ ③ CMA ⑥	OBS.:	OBS.:
	OBS.:	OBS.:	OBS.:		
Mathematics	② ESA ③	③ RPS	PPP ②	ESA ③	① PPP ②
	② IMA ③	④ ①	②	③ RPS ④	⑤ PPE e
	OBS.:	③ CMA ⑥	② IMA ③ ③ CMA ⑥	OBS.:	OBS.:
		OBS.:	OBS.:		

PPP - Preparation of the Program Plan

PPE - Submission of the Program to the Studio

ESA - Preparation of Script and Items of Evaluation

RPS - Revision and Preparation of Script

IMA - Initiation of the preparation of the Accompanying Material

CMA - Conclusion of the preparation of the Accompanying Material

(-) - Delay

Figure 4.3.

Included in Figure 4.2 are control points for after the script goes to the studio for production. These quality control points are:

1. D4 - Control of material for TV production.

Adequateness of the scenery, films and graphic arts produced, as well as music.

2. D8 - Control of the material for Radio production. /68

Adequacy of the sound effects and music.

3. D6 and D9 - Final approval

After evaluation made by the groups, a final decision as to storing or re-recording the program.

The two documents shown in Figures 4.2 and 4.3 are the fundamental documents of the control of production of didactic programming.

This method of control of production of materials from TV, radio scripts, and accompanying material to the programs recorded in their final phase, is, as far as we know, the first system of control of production and quality in use, for a program which utilizes a balanced combination of media.

So far the system is operating successfully.

3.1. Accompanying and Evaluation Material

Detailed information on evaluation procedures and progress of the Accompanying material since the last revision meeting are found in other parts of this report.

However, it is important to note that a new technique patented by the INPE was initiated for both. The system permits administration and grading, by computer, for all students, on the basis of student by student, day by day, assignment by assignment.

The large amount of data produced as the student proceeds through the subjects will permit future studies of the strong and weak points of the assignments, individually and collectively. Also, as we shall see, the effects of different styles of programs used via TV on learning will be determined.

As far as we know, this is the first evaluation of the effect of the style /69
of educational TV on learning.

The system is now being implemented. The computer program is ready and cleared. A complete statistical structure for the SACI Project was established and simulated initial data are being prepared for a series of tests. Using the studies made, the system was projected to expand so as to be able to handle several million students, with little or no modification. Finally, for the utilization of this automatic system of administration and grading by a computer, the trade-offs between the various alternatives and the logistics problems for an efficient use of the computation equipment were studied and established. The results show the best procedure for this operation which involves preprocessing the input MARK-SENSE sheets (that is, coded by simple pencil marks) so as to yield an output on punched cards or tapes with all the required data, to be conducted in Natal, capital of Rio Grande do Norte State.

The final processing of the tapes or cards prepared in the INPE/RN in Natal and statistical verifications will be conducted in the INPE, in São José dos Campos.

4. Additional Studies in Process

4.1. Surveys and Tests

A series of new studies is under way to assure the quality of programs, andaalso to solve the identified logistic problems, now that the project is in its production phase (Figure 4.4).

The survey of the characteristics of the schools, teachers and students was completed and it is in the phase of tabulation by the computer.

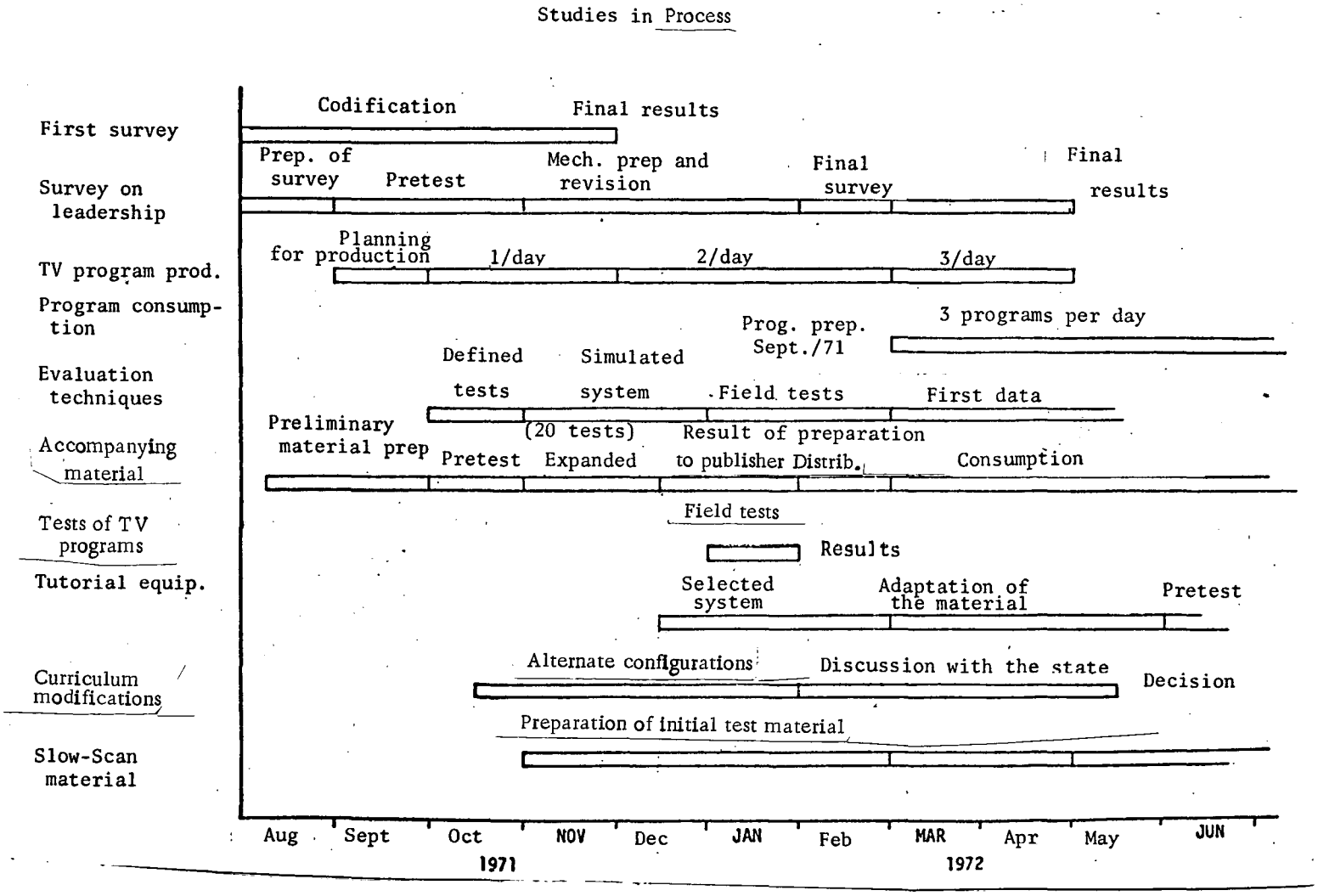
Studies in Process
First survey
Codification
Final results
Survey on leadership
Prep. of survey
Pretest
Mech. prep and revision
Final survey
Final results
TV program prod.
Planning for production
1/day
2/day
3/day
Program consumption
Prog. prep. Sept./71
3 programs per day
Evaluation techniques
Defined tests
Simulated system
Field tests
First data
Accompanying material
Preliminary material prep
(20 tests)
Result of preparation
Pretest
Expanded
to publisher Distrib.
Consumption
Tests of TV programs
Field tests
Results
Tutorial equip.
Selected system
Adaptation of the material
Pretest
Curriculum modifications
Alternate configurations
Discussion with the state
Decision
Slow-Scan material
Preparation of initial test material
Aug
Sept
Oct
NOV
Dec
JAN
Feb
MAR
Apr
May
JUN
1971
1972

Figure 4.4.

Through this survey, we obtained a good idea of the nature of the population with whom we will work. For instance, among other parameters, we determined the number of students that each professor works with, the construction characteristics of the schools of Rio Grande do Norte State, and the age and experience of lay teachers (Figure 4.5): /71

Teacher's Age				
Age	Teachers	Percentage		Average
		Individual	Accumulated	
15-18	6	6.6	6.6	28 years
19-25	31	33.6	40.2	
26-35	26	28.2	68.4	
-35	29	31.6	100.0	
Years	Teaching Experience			
1-5	32	34.7	34.7	8 years
6-10	26	28.2	62.9	
11-15	22	24.0	86.9	
16-20	8	8.6	95.5	
21-25	2	2.2	97.7	
-25	2	2.2	99.7	

Figure 4.5.

The above data are based on 92 teachers of the area of the EXERN chosen at random (including urban and rural zones), corresponding to 15.3% of the total interviewed in May 1971 (Figure 4.5).

This survey made clear that we are not dealing with inexperienced people; /72 the relatively short period of formal education (4 to 6 years) is in a certain way compensated by experience and maturity. Naturally this must be taken into consideration in the definition of the content and format of our programs.

Hence, a pre-test of the accompanying material was made. Now we are performing a more extensive test in Rio Grande do Norte State, using material intended to be utilized in the 1972 Mission of the experiment. In this last test, lay teachers are being requested to work 5 separate assignments, to determine their comprehension level and test the clarity of the material. Also, an attitude test is included which provides information on the material level and the amount of "fading[3]" which we will use in the programmed instruction material. The results of this test will appear at the end of 1971. Similar surveys must be conducted quarterly.

We are preparing a simulation system using 5 of the programs already recorded with respective accompanying material. This will give us a better comprehension of the acceptance level of the programs being produced, and the degree of relationship between the program and the respective accompanying material.

A second survey was elaborated and will be administrated in Rio Grande do Norte State in February 1972. This survey will define the "innovative leadership" in each community. The material to be used was pre-tested and revised and a final 170-question interview questionnaire, with appropriate characteristics of cross-correlation, will permit us to determine in each community the leader segment whose support and cooperation are essential for the acceptance and success of an innovative project such as the SACI Project. /73

4.2. Slow-Scan TV

The potential of Slow-Scan TV as a teaching system has been recognized for some time. One advantage of such a system is the narrow band width necessary for communication; even telephone channels can be used for transmission of images. The disadvantage is that only still pictures can be transmitted, and depending on the available bandwidth, an interval of

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[3]"Fading": consecrated term in Programmed Instruction; it is a continuous lessening in the intensity and number of cues as the program advances.

up to 25 seconds may be necessary while an image fades on the screen and is replaced by another. This period of fading represents a significant difficulty in the accompanying material production: which instructional contents can be provided during this interval of replacement?

To evaluate what can be done successfully, a program of study was initiated to study various possible instructional configurations with Slow-Scan. One possibility is to use the fading interval to obtain answers from the students on the accompanying material. This possibility and others will be examined at the beginning of next year. The first simulation of Slow-Scan program will be completed before March. By that time, the results will be compared with those of other media used in the Project.

4.3. Tutorial and Self-Teaching Systems

Last year, some self-teaching systems were introduced on the market, with different degrees of flexibility and utility. One system, for instance, uses Super-8 mm film driven by a synchronized tape containing voice and music.

A second track on this tape supplies the pulse to advance the film to be /74
projected, which can operate at regular speed or slow motion and even statically. The value of this equipment for Project SACI must be appraised. Equipment of this kind and other similar systems would permit various trade-offs between alternatives: the use of the system in the TV studio instead of the conventional "Telecine" equipment, the use of this equipment as a tutorial aid in the class-room or in a learning center, etc.

A wide variety of this new equipment has been identified and its potential is being checked for (use in) the SACI Project.

4.4. Change of Curriculum

As was mentioned earlier, the curriculum which is being used for the production of programs and accompanying material is that of Rio Grande do Norte State. With the combined use of TV, radio, accompanying material and teachers, it is possible that better methods of presentation of subjects be divulged. For instance, the concept of "immersion," in which a subject is presented each

day instead of fragmented presentations of a variety of subjects in the same day, is being considered.

Other experiments which are being conducted all over the world suggest that this concept of "immersion," using the variety of presentations permitted by the methodology of the SACI Project, provides significantly improved learning: the long period of time in the same subject, presented under the variety of formats that the SACI Project uses, transforms the learning into a project centered on the student.

4.5. Studies of Internal Operations

The accomplishment of the schedule of programs production, shown in Figure 4.1, which evolved from the set rate of recording of one program per day to a rate of 3 per day, and taking into account the rate of program consumption, an expansion of the facilities becomes inevitable. The present facilities are the training studio and the corresponding equipment: 3 cameras, 1 videotape unit and usual support equipment. Based on the present production of one program per day, studies were made for expansion of the capabilities at minimum cost. Various configurations were considered. /75

In November, these studies were concluded and a system was approved which requires only a small adjustment in the existing rooms. Such a system will provide 2 studios which will permit setup and rehearsal in one studio while recording takes place in the other. An adjustment of the activities of the studio staff will permit double or even triple the present rate of program recording with little addition of staff.

The arrangement proposed will permit a 95% utilization of the facilities, twice as much as is obtained through the most practical commercial TV.

To improve the technical quality of the material produced, studies were conducted on the characteristics of the TV system: resolution, linearity, grey scale, tape drop-out and sound quality. Based on these, a preventive maintenance system is being created to assure continuous conformity with commercial standards. Some small additions of equipment were incorporated

into those already existing; better sound consoles for TV and Radio, with multiple inputs and a set of microphones with different characteristics to serve the various program formats: low-noise cardioid microphones for formats using small groups, microphones for programs with large casts, etc.

CHAPTER V

DIDACTIC PROGRAMMING

Specific Considerations /76

In this chapter, the subjects presented in the previous chapter are detailed in terms of pedagogy and communication.

Samples of scripts and pictures of TV programs are presented and a brief explanation is given on Training Courses on Educational Radio and TV, developed this year in the INPE, and how their results were used.

With regard to the accompanying material, the generalities in Chapter IV are detailed here in terms of Programmed Instruction conception and computer processing.

1. Didactic Considerations

1.1. Curriculum of the Course for Preparation of Lay Teachers

The curriculum was elaborated in order to:

-- give the student-teacher information corresponding to the compulsory nucleus of the first four years of primary teaching;

-- give the student-teacher pedagogic and didactic information to form a basis for his present and future activities;

-- give the student-teacher information suitable to his psychological, social and economic needs.

The items which served as a basis for the organization and elaboration of /77
the programs in the various areas were:

-- Official program of Rio Grande do Norte State,

-- Population needs (data supplied by the analysis of various surveys conducted in various regions of Rio Grande do Norte State).

-- Resources of medias to be utilized in the experiment of Rio Grande do Norte State.

1.2. Goals to Be Achieved by the Various Areas of Study

Portuguese - The program was elaborated to develop in the student-teacher abilities in written and oral communication.

Mathematics - the program was elaborated to develop reasoning abilities in the student-teacher. This area uses learning through discovery (theconcept is inferred through content stimulation).

Natural-Sciences and Health - the program was elaborated to develop in the student-teacher the proper attitudes and habits in terms of nutrition, hygiene, health, natural resources and the use of technology.

Social Studies - the program was elaborated to develop in the student--teacher the capacity of observation and critical interpretation to teach him how to solve problems and situations existing in the environment.

Civic and Moral Education - the program was elaborated to prepare the /78
student-teacher for the conscientious exercise of citizenship responsibilities.

Pedagogical Notions - the program was elaborated to give the student--teacher psycho-pedagogic information for the development of positive attitudes in the interaction between teacher and student consequently resulting in better learning.

Didatic Notions - the program was elaborated to give the student-teacher information on teaching processes, that would permit efficient action in terms of potentiality and inter-relationship development of the students.

1.3. Preparation of the Program Plan

The program plan (Figure 5.1) establishes the guidelines for the elaboration of TV and Radio scripts and Accompanying Material.

The program plan is divided into 5 parts:

1. Behavioral or Instructional Objectives

The objectives outline what the student must be able to do after attending through TV and radio class and studying the accompanying material.

2. Attention

This is the first part of the TV/radio class. The attention of the student is directed to the subject which will be presented.

3. Stimulation /80

Posing of a problem which may or may not be familiar to the student.

4. Development

Presentation of the subject of the class, solving the problem which was presented in the Stimulation.

All information and/or concepts which will be developed in the TV/Radio classes and by accompanying material are presented summarily in this part of the Program Plan.

5. Action

At the end of the TV/Radio class some activity is required from the student (for instance: to answer questions, to think, to remember, etc.).

1.4. Supervisor and Lay Teacher Training

The development of material and training group will develop the following material for the supervisor and lay teacher training course:

Supervisors:

Manual for the supervisor, containing:

-- Information on the experiment in Rio Grande do Norte State;

-- Information on supervisor function during the experiment;

-- Report models, evaluation and observation forms to be filled out by the /81 supervisor;

-- Information on the utilization and handling of the technological resources (TV/radio);

-- Information on the utilization of the accompanying material;

-- Information on the utilization of techniques of evaluation to be applied.

Teachers:

During training, information will be supplied and the lay teachers will be trained in various techniques introduced in the Course for Preparation of lay teachers.

-- Information on the experiment in Rio Grande do Norte State;

Group of Production: Area supervisor - Wilma TV Producers - Arnon, Cecilia, Sonia	Course - Preparation of lay teachers (first four years 1st grade) Area - Pedagogic notions Unit - "How Important it is to Play" TV/Radio and Observation Material		Class No. 5	
		Resources, Methods	Duration	Lines
Behavioral objectives	I - The student-teacher must identify the causes of the importance of play in the development of the child.			
Attention	TV - "Flashes" of various types of play toys and games Ra - Sounds of playing children	TV films Ra dramatization		
Stimulation	TV/Ra Children playing - mother calls the child and doesn't let him play with other children.	TV films Ra - dramatization		
Development — Subject	1. It is by playing that the child develops (Ex. the Child plays talking to himself- verbal development. Verbal motor development. Child's social development (socialization) is made by playing groups. 2. Playing activities are characterized by personal pleasure felt by the child when he plays. The result, constructive or not, does not matter for the child. The reward or pleasure is the activity itself and not its results. 3. It is through games that children explore the environment (exploration) in the same way it is through playing that the child learns.	TV - films - live scenes - Director Ra radio dramas -Narrator		
Development — Fixation	It is through games that the child develops and learns. The pleasure is in the activity itself.	TV live scene Ra drama		
Action	TV - Children playing. A sad boy looking at other children playing: "What a shame they didn't let this child play." Ra - Same as TV.			
		TOTAL		

Figure 5.5.

-- Information and training on the utilization and handling of the technological resources (TV/radio);

-- Classes by TV/radio for the presentation of the course and the content of several areas, as well as the scope of each area;

-- Information and training in the use of the accompanying material;

-- Information and training in the use of techniques of evaluation.

2. TV Scripts and Programs

2.1. Introduction

After the training course CEDO/INPE, from January 11, 1971 to April 8, 1971, we started the phase for experimental production and recording. At that time it was necessary:

a. to find feasible formats for our programs, and /82

b. to establish TV didactics.

From these needs we started the experiment by the establishment of hypotheses and evaluation rules for each program and each area (Portuguese Language, Mathematics, Social Studies, Natural Sciences, Pedagogic Notions and Civic and Moral Education). Immediately after recording, the recorded programs were checked by the responsible group (Writers, Producers, Pedagogues and Area Specialists) who analyzed each program, taking into account the following production. At the end of the experiment, programs in each area were checked together, by all the elements of Production, DMT Group and Evaluation who answered a questionnaire for each program (Figure 5.2). The survey data were made available to the groups. This analysis confirmed some hypotheses and invalidated others.

2.2. Hypotheses Made

a. Production would be facilitated if all areas would have the same situation from which examples and stimulating situations could be taken.

b. Existent resources are sufficient for the recording of 3 programs per day, maintaining the same production and consumption curve.

c. Number of concepts depends on the format and duration of each program.

d. Programs would be better if examples and counterexamples would be taken from common experiences of the children and related to the region.

EVALUATION FORM OF THE RECORDED CLASS

Subject:.....

Class number:.....

Evaluator:.....

Note: Check the corresponding box:

1. Video: Little Sufficient Excessive

   Suitable to the subject: Yes / No

2. Audio

--music and effects:	Adequate	Yes	No
--voice:tone	Adequate	Yes	No
	Expressive	Yes	No
--rhythm	Fast		
	Normal		
	Slow		
--text	Insufficient		
	Sufficient		
	Excessive		

3. Narrator:

--Appearance:	Adequate	Yes	No
--Voice: tone	Adequate	Yes	No
	Expressive	Yes	No
--rhythm	Fast		
	Normal		
	Slow		

4. Motivation and Information - Dephasage: Large / Small / Inexistent

   Suitable to the audience: Yes No

Figure 5.2.

Figure 5.2 (Cont'd.)

5. Vocabulary
   - Very easy
   - Good
   - Very difficult

6. Number of concepts:
   - Few
   - Sufficient
   - Excessive

7. Were the concepts presented clearly? Yes No

8. Examples:
   Suitable to the subject Yes No

9. Reinforcement
   - Insufficient
   - Satisfactory

10. Review of the concepts
    Quantity:
    - Not necessary
    - Insufficient
    - Sufficient
    - Excessive

    Quality: Did it make assimilation easy? Yes No

11. How would you classify the program?
    - Very good
    - Good
    - Reasonable
    - Weak

12. Other remarks, if necessary.

2.3. Procedure

a. The producers and pedagogues have together chosen the book "Alexander and Other Heroes" by Graciliano Ramos, for the richness of description of types and environment and the scope of the programs of the different areas.

b. We established a schedule for the TV sector, aiming at the recording of 3 programs per day, with follow-up and control of all steps (Figures 5.3 and 5.4).

c. We allowed each group to determine the number of concepts to be taught.

d. The producers were allowed to choose the examples, based on the chosen area, bearing in mind the repertory of the students.

2.4. Results

a. The experiment showed that the production would not be easier with the utilization of the same vehicle for all areas. The unification restricted freedom of the different groups and made the programs artificial in the motivational situations and subject approach. In some cases, it was not possible to use the same vehicle.

b. We verified the impossibility of recording 3 programs per day, with the resources available. Experience, however, enabled us to detect the problem areas and to solve problems giving more resources to some sectors and shaping the production more realistically. Our concern, however, with the crossing of consumption and production curves, (Figure 4.1.a, Chapter IV) leads us at present to aim at the gradual increase of the number of recordings while we generate the essential resources. Presently we are recording one class per day (Figure 5.5).

c. With regard to the number of concepts, the hypothesis was correct. /89
This number varies according to the format and the duration of the programs. However, there is a greater dependency in relation to the duration of the class than to the format. In our programs of 10 to 15 minutes, we limited the concepts developed to a maximum of 3.

Weekly Forecast - TV

Month: Sept/October Week: 9/27 to 10/1

	Monday 27	Tuesday 28	Wednesday 29	Thursday 30	Friday 01
Pedagogic Notions	Requests 5 6	Arts 5 Scenery 6	Prompter 5 6	CINE 5 Photo 6 Sound	Develop- 5 ment 6
	Recording	Recording 2			
	Develop- 3 ment 4	Develop- 3 ment 4	Develop- 3 ment 4	Final 3 check 4	Recording 3 4
Mathematics		Requests 3 4	Arts 3 Scenery 4	prompter 3 4	CINE 3 Photo 4 Sound
	Recording		Recording	Recording	
	Develop- 1 ment 2	Develop- 1 ment 2	Develop- 1 ment 2	Develop- 1 ment 2	Final 1 check 2
Sciences			Requests 5 6	Arts 5 Scenery 6	Sound 5 effects 6
	Final 2 check	Recording	Recording 2	Recording	
	CINE 3 Photo 4 Sound	Develop- 3 ment 4	Develop- 3 ment 4	Develop- 3 ment 4	Develop- 3 ment 4
Social Studies				Requests 5 6	Arts 5 Scenery 6
	Develop- 2 ments	Final 2 check	Recording	Recording 2	Recording
	Prompter 3 4	CINE 3 Photo 4 Sound	Develop- 3 ment 4	Develop- 3 ment 4	Develop- 3 ment 4
Portuguese	Recording	Recording			Requests 4 5
	Develop- 1 ment	Develop- 1 ment	Final 1 check		Recording 1
	Arts 2 Scenery 3	Prompter 2 effects 3	CINE 2 Photo 3 Sound	Develop- 2 ment 3	Develop- 2 ment 3

Figure 5.3.

TV Weekly Control

Month - Sept/Oct. Week - 9/27 to 10/01

	Mon. 27	Tues. 28	Wed. 29	Thurs. 30	Fri. 01
Pedagogic Notions	Requests 5 and 6 - OK	Art 5 & 6 - OK		Filming cancelled set designer busy in another area	
Mathematics	It was not possible to recover the filming set designer busy in another sector	Math request 2 entered. No. 3 did not enter because of group restructure	Math Arts ready		No filming Set designer busy in another area
Sciences	Arts were not ready for filming		Request 1 entered in (contamination) considered pilot class); Request 2 delayed - reformulation		
Social Studies		Cancelled filming of E.S.3,4 because set designer was busy in another sect. Prog. 2 recorded insert table--tops are to be done. Photos-Neg. BAD T -		No request because of script restructure Recording postponed Photos were not delivered by lab.	
Portuguese	Request 3 OK-In execution Portuguese 2 in Arts-OK		Photos of Port. 2-OK Cancelled filmings. Set designer in another area		Portuguese recording 1 - OK. to 8:30 P.M. Request 3.4 OK

Figure 5.4.

d. The examples and counterexamples were more efficient, when taken from students' repertory, but were similar to some degree. It was not considered necessary to link to regional aspects. We also concluded that radio dialect (the same for the whole country) would be the one used, as the simulation of regional accent, even the best one, would always sound false, with possibility of damaging the class. We avoided using regional words from Sao Paulo or Rio Grande do Norte and used always common vocabulary.

e. From the interaction between producers and writers there resulted a type of script more suitable to our work because it maintains the writer's freedom, which is needed for the accomplishment of the program. The writer was in charge of the types of takes and changes in takes, due to space limitatio tions in our studio which requires moving the camera and sets that the writer is more familiar with. Exception of important takes for content (detail, low camera angles, closeup, etc.) that the script emphasizes.

f. At the beginning of the experimental phase, we were aware of the lack of documented information (photos, films, interviews, etc.) about the region in which we would operate. The former leader of the Studio and Training Group went to Rio Grande do Norte State, and brought back 900 pictures and about 15 hours of interviews with teachers, students and common people in general. In these observations, we detected the familiarity of the people of the area with television and the public preference for certain programs on commercial TV. Vocabulary research made by Professor Protasio of the University of R. G. do /90
Norte State was recorded on tape. Our cinematographer also went to Rio Grande de/ Norte State and brought back additional information in the form of photographic records and scenic materials.

2.5. Our Present Programs

a. Portuguese Language

Using the techniques of drama andutilizing the scene created originally for all areas, the writers of Portuguese elaborate stimulating situations and, through Das Dores, a teacher who came from the city to teach in the area, transmit the concepts of the area.

Studio and Training Group - TV Sector
Production Schedule

	Mon	Tues	Wed	Thur	Fri	Mon	Tues	Wed	Thur	Fri	Mon	Tues	Wed	Thur	Fri	Mon	Tues	Wed	Thur
Ped. Notions	Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing									
						Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing				
Science		Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing								
							Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing			
PORT.			Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing							
								Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing		
Social Studies				Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing						
										Requests	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing	
Math.					Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing					
										Requests	Arts Scenery	CINE Photo Sound	Revi-sion	Revi-sion	Revi-sion	Revi-sion	Check	Re-hear-sal	Record-ing

Figure 5.5.

b. Mathematics

Creating the "wonderful world of mathematics," the writers try to clear up the difficulties of the subject, at the same time using magic solutions, in terms of production, to present films, table-tops needed to understanding of the subject. A comic teacher livens up the situation of two characters, with whom it is pretended that the lay teacher is identified. The action and fixation are created, when Jo, oneof the characters, teaches her younger brother things learned with the teacher. The technique of the program is similar to the TV shows (Figure 5.6).

c. Pedagogical Notions

Using effectively charged images, the program utilizes publicity elements. Situations in the classroom are shown and the narrator (not shown on the TV screen) directs the attention of the student-teacher, isolating, emphasizing and explaining facts. A few texts and selected music help to create the required atmosphere.

d. Social Studies /92

Due to the nature of the subject,the method of telejournalism (simultaneous presentation of image and voice) seems appropriate to us. Films and live scenes are very much utilized in this area. A narrator links the parts and establishes contact with the TV-student (Figure 57).

e. Sciences

Same characteristics as Social Studies area. In Sciences, however, communication emphasis is placed on the narrator,who talks about the subject of the class, making demonstrations, presenting films and other visal resources, for the elucidation of the text. In this area,there is a predominance of the narrator.

2.6. Conclusion

We maintained the following procedure: after recording the class, we gathered together pedagogues, specialists and writers and by means of a questionnaire, (Figure 5.8) evaluated the recorded class. We believe that this analysis will provide us with short-term data for improvement of our programs. The research is still continuing. The evaluation of terms of learning, with a

population similar to the one we are now dealing with,will be done as soon as we have a satisfactory number of recorded classes, and may introduce new elements for the elaboration of future classes.

At the end of this section we present 2 scripts of present programs as an example.

Figure 5.6. Mathematics Program.

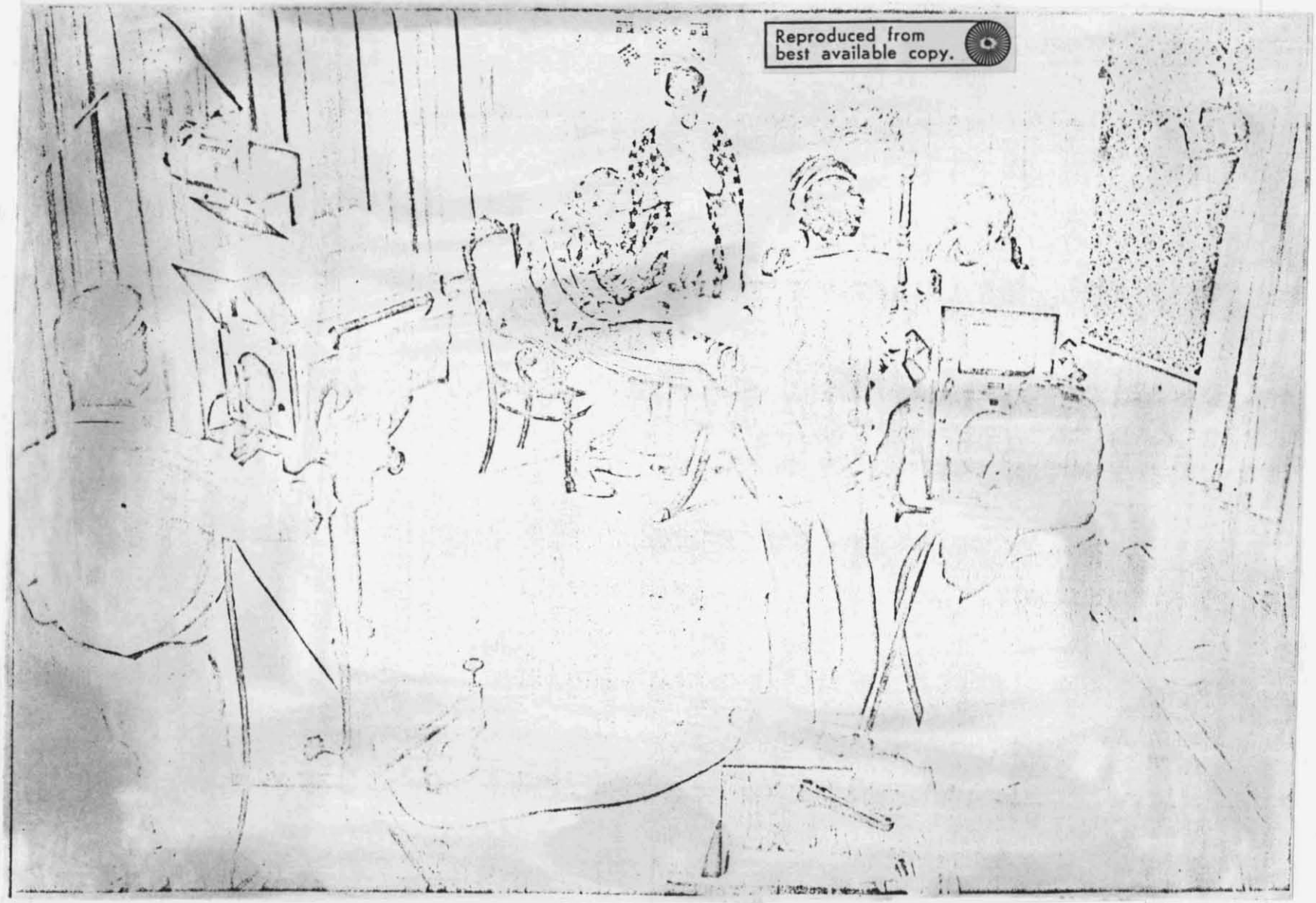


Figure 5.7. General View of the Studio. Recording of social studies class "Hereditary Captaincies"(Brazilian History Subject).

Post-Production Evaluation /94

Instructions

1. The evaluations of each program will be made and seen onlyby the group in general, and occasionally by the SACI Management staff and Visitor specialists, properly authorized by Mr. Amancio. Any alteration in this prodecude must be noted on this form.

2. Fill out all items on this form and turn it in to Dr. Klein, within one hour after the meeting. No signature required.

Date:

Area:

Subject:

Class no.:

Quality____% general

Classify each item on the following basis: 100% - perfect; 80% - good; 70% - regular; 50% -Bad; 40% - very bad.

1. Quality of program (the program has good quality, if film used is good, sound and music are good, voices are clear,takes are appropriate, transitions between scenes smooth).

1.1. General quality of recording (that is, dropouts, out-of-focus images, etc.)

1.2. Quality of film (that is, scratched, well done)

1.3. Clarity of sound (you heard clearly, too loud)

1.4. Appropriate music (matches the action; very fast or very slow, very loud or very low, interferes with comprehension)

1.5. Appropriate takes (presents the objects or persons clearly; very long)

1.6. Transitions (without sudden jumps or blips)

2. Contents_____% general

2.1. Was at least one concept developed completely?

2.2. Were details of each concept fixed by repetition and/or other techniques?

2.3. In the development of each concept was there enough variety to keep your interest?

2.4. Were the presented examples original and/or clear for the region?

2.5. Was there enough new information?

2.6. Did the lesson leave a clear idea of something to be done, thought or remembered?

3. Performance of actors and narrators

3.1. Narrators_____% in general

-- If less than 80%, why?

3.2. Actors_____% in general

-- If actors were used, which was the best character?

Name:

-- Who was the actor who performed worst (if any)?

Name:

Why?

Signature of evaluator, only if not staff member of the SACI group

Figure 5.8.

Program: Pedagogic Notions - Class No. 5
Subject: Playing is important
Writers: Cecilia/Arnon
Pedagogist: Wilma
Producer: Bigal

TELEVISION

1.	Table Top Opening	Audio: Opening theme /96
2.	Film Children playing: boys playing soccer; goal is made.	Audio: Gay music Audio: Matched
	Boys flying kites	
	Boys in the park; slide, see-saw	Audio: Light music
	Boys playing with balloons	Audio:
	Ring-around-the-Rosy	Audio: Corresponding song
	Live scene Mother and son	Mother: Come inside, boy. This boy only thinks about playing.
3.	Narrator	Narrator: Do your students play? Sometimes people think that children play too much. But do you know that playing is important for them? It is through playing that they are discovering the world...
4.	(Outside scene) Children running: playing tag	Audio:
5.	Boy playing horsy (with a broom)	Audio: Stampede of horses /97 Boy off camera: Yahoo! There goes the cowboy!

6. Blindman's buff - boy blindfolded, trying to catch another	Narrator: The child plays for the sake of playing...
7. Film Leap-frog	Audio: By playing the child learns how to cooperate with other children.
8. Girls with small pans Playing house	Narrator off camera: In this way, she is learning...
9. Film Girl and doll	Narrator off camera: Talking to the doll, she plays with words, discovering new sounds, developing the language.
10. Marbles game	Sound: Voices of the boys playing -Wow, I won. Now it is your turn. -Good, I won again. -Let's play some more.
11. Film Children jumping rope	Narrator off camera: Physical exercise is a need for growing.
	AUDIO:
12. Oral game: Everybody has to say the name of a flower.	Audio: Boys' voices -Now we can only say the names of flowers, OK? -OK; rose -daisy -carnation..... Audio: Narrator off camera: Do you see? They are learning new words.

/98

13. Children play with clay; they make dolls and objects.

Audio:
Narrator off camera:
This way the small muscles of the hands, so much used in handwriting, develop.

14. Film
Children's playground

Sound: Music according to the scenes

15. Boy builds houses, dismantles them, builds them again

Narrator off camera:
Seeing, touching, feeling, children grow up... The child plays for the sake of playing. He builds houses, dismantles, rebuilds. The joy is in the activity, not in the result.

16. Film
Games: tin drum

Sound: Drum sound
Narrator off camera:
All play is happy. Playing, the child develops his senses, his body...and learns many new things.

/99

17. Ring-around-the rosy (girls)

Audio: girls' voices singing

18. Film
Boys playing soccer

Audio: very noisy music - sound of children playing.

19. Close-up of a sad child's face--
Fade out

20. Film
Girls playing hopscotch; scenes of children playing on the beach; boys playing with spinning top;

Audio: corresponding to the scenes.

21. Back to the sad boy's face.

Audio: very sad

22. Film

Boys pulling little cars made of matchboxes; making and playing bamboo flutes.

Audio: including the sound of a bamboo flute.

23. Boys make soap bubbles

Sound:

Music out

24. Camera dollies in on the sad boy at the window.

Zoom in on his eyes (filled with tears)

/100

Narrator:

What a shame! They don't let this child play.

25. Superimposed:

P E D A G O G I C N O T I O N S

Audio: closing music

Fadeout

Program: Portuguese - Class No. 2
Subject: Phrase
Writers: Climerio/Victor
Pedagogists: Gilka/Tirza
Producer: Bigal

TELEVISION

1.	Opening	Audio: Music /102
2.	Alexandre, Liborio, Firmino and Gaudencio are talking in a corner. Cesaria cleaning up the table and sweeping the floor.	Music down and out - loud knocks at the door.
3.	Everybody stops and looks at the door.	
4.	Door	More knocks.
5.	Cesaria looks at the others and shrugs shoulders interrogatively. Cleaning hands on dress, walks towards the door. Cesaria	More knocks. Cesaria: (annoyed) - I'm coming, I'm coming!
6.	Cesaria's hand partially opens the door	Voice: -Is this Dona Das Dores Sacramento's residence?
7.	Cesaria opens the door a little more	Cesaria: -Yes, it is.

8. Zoom-in: detail of Cesaria's hand receiving a letter from the messenger. Cesaria closes the door. camera follows Cesaria's hand holding the letter.

Cesaria: /103
-Das Dores! There is a letter for you, my dear!

9. Das Dores

Das Dores:
-For me? Let me see.

10. Closeup of Das Dores opening the envelope and taking out the letter.

11. Double shot: Das Dores starts reading and Cesaria watches. Das Dores looks at Cesaria.

12. Cesaria still looks at the letter. But when Das Dores looks at her, she gets disturbed and goes back to clean the table, etc.

13. Das Dores goes on reading the letter.

14. Group of men: one of them glances at Das Dores.

15. Laughing, Das Dores finishes reading the letter.

16. Group of men. Alexandre, awkward, smiling sickly...

Alexandre: /104
-Letter?

17. Das Dores

Das Dores:
-Yes, a letter.

18. Alexandre

Alexandre (more awkwardly still)
-Ah.

19.	Das Dores (Smiling)	Das Dores: -I know that you are dying to know who its from. Come here to the table and I'll tell you.
20.	All of them rush to take their seats. Cesaria is the most excited.	
21.	Das Dores	Das Dores: -This letter is from Maria de Fatima, a girl who studied with me and lives in the city. It's a very interesting letter and it came at the right moment. It will help us to talk about what Mr. Gaudencio asked yesterday.
22.	Gaudencio	Gaudencio: -Yeah! What I asked yesterday...is... that when we write a message, a letter, what kind of language are we using?
23.	Das Dores	Das Dores: /105 -Uh-huh [affirmative], that's right. This letter for example (shows it).
24.	Detail of letter	Here the words are written, that means that Maria de Fatima represented in letters the words she wanted to say.
25.	Liborio	Liborio: -Then, when we write, we are representing by letters what we say?
26.	Das Dores	Das Dores -Yes, Mr. Liborio...(slowly)

27.	Visual: Card with a drawing of persons talking and the words said are written in balloons.	...and when we represent the sounds of the speech by letters...
28.	Fade to card where only the balloons with written words are seen.	...we are using the written language.
29.	Das Dores	Das Dores: -Written language is the one which represents the sounds of speech by letters.
30.	Superimposed: W R I T T E N L A N G U A G E	
31.	Alexandre	Alexandre: /106 -That means your friend Maria de Fatima used written language when she wrote that letter, right?
32.	Das Dores	Das Dores: -Yes, that's right.
33.	Alexandre	Alexandre (very curious) -And what does she say?
34.	Das Dores (smiles)	Das Dores: -I'll tell you, godfather. She is telling me that finally her grandfather's will was settled. But in an unexpected way.
35.	Firmino	Firmino: -And how was that?
36.	Das Dores	Das Dores: -It was this way...
37.	Fade and cut to:	Audio: transition

38. Tribunal. Closeup of judge's gavel. Zoom out until the scene appears. Three persons sitting at the desk in front of the judge: tailor, doctor and baker.

Judge (uses the gavel, clears throat and speaks solemnly): Let's proceed to the reading of the will (looks for it in the papers but doesn't find it) (He loses solemnity)
-Oh, where is the will?

39. The baker hands over an envelope nervously.

Baker: /107
-Oh, here it is, here it is, your honor.

40. Judge
He opens the envelope, and finds only a small piece of paper. He reads once silently, takes off glasses, reads again and shakes his head negatively. Finally he reads aloud.

Judge (solemn and annoyed)
-Hum. Let's proceed to the reading of the will.
-"I leave everything to the tailor but not to the doctor nothing leave to the baker."
-Well, from this note, I confess that I don't understand very well to whom the deceased left his possessions.

41. Tailor

Tailor:
-If you excuse me, I'd like to read the note.

42. Judge

Judge:
-Of course. (hands it over)

43. Tailor

Tailor:
-But it's obvious. More than obvious. It is written here. Let's see: "I leave everything to the tailor, but not to the doctor. Nothing leave to the baker." No doubt this is the wish of the deceased.

44.	Doctor (interferes)	Doctor: -Wait a moment, wait a moment. Let's make things clear! Your honor, will you permit me to read?
45.	Judge	Judge: /108 -Yes.
46.	Doctor (brief silent reading)	Doctor: -Ah, as I thought. That was not the will of the deceased. Here it is written: "I leave everything to the tailor? But no, to the doctor! Nothing leave to the baker."
47.	Tailor and baker protest. Judge pounds gavel. (Everybody is quiet).	Judge: -Silence in court. (Talks to the baker) - Would you please read it?
48.	Baker (in silence)	Baker (feeling favored) -Thank you, your honor, -I don't see any reason for discussion. "I leave everything to the tailor? But no! To the doctor? Nothing. I leave to the baker."
49.	Everybody protests at the same time. Judge pounds the gavel. Silence.	Judge: -Silence, Silence, Well... I have a decision for the case.
50.	Each one looked to the other as if he were the heir.	
51.	Judge	Judge: /109 -Due to the difficulty in the reading of the will, I vote that the possessions go to the municipality and this way benefit all the citizens. Court is dismissed (pounds gavel).

52. Everyone
Fadeout, cut to:

Audio: Voices fade and merge.
Transition music

53. Alexandre's house
Everybody laughing.
Cesaria.

Cesaria:
-What a complete misunderstanding, my dear.

54. Das Dores

Das Dores:
-That's right, all because Maria de Fatima's grandfather didn't write properly what he wanted to say.

55. Liborio

Liborio:
-And why didn't he write it properly? What should he have done?

56. Das Dores

Das Dores:
-Look, Mr. Liborio, you know when we write we are representing the sounds of speech by letters, don't you?

57. Liborio

Liborio:
-Yes, I do.

58. Das Dores

Das Dores: /110
-Very well, now tell me, when we speak and we want to be understood by others, what do we have to do?

59. Liborio

Liborio:
-Well, we need to put the words in the proper order.

60. Das Dores

Das Dores:
-Uh-huh [affirmative]. Then, Mr. Liborio, these words that we put in order form a...

61. Superimposition:
P H R A S E

...phrase

71. Das Dores

Das Dores:
-So, when we write, we must use some sign that represents this special way of speaking.

72. Alexandre

Alexandre: /112
-But, what are the signs?

73. Das Dores

Das Dores:
-Pay attention. We have...

74. T/C - Table top Punctuation

Das Dores off camera:
The period which represents a lowering of the voice at the end of the phrase; the exclamation point, represents surprise, admiration; the question mark represents a question; and the comma, indicates pause.

75. Cesaria

Cesaria:
-Ah, you mean that the girl's grandfather didn't put any of these signs in the will?

76. Das Dores

Das Dores:
-That's it, godmother! As he didn't use the signs, nobody knew what he was stating or asking; nobody knew what he wanted.

77. Firmino

Firmino:
-Then everybody read the way they wanted.

78. Liborio

Liborio: /113
-And each one turned it to his own advantage.

79. Das Dores

Das Dores:
-Let's see then, the will had several phrases written this way:

62. Gaudencio

Gaudencio:
-So far I understand. But what has that to do with the misunderstanding of the will?

63. Das Dores

Das Dores:
-It does because when we write we must put the words in order, each one meaning or transmitting things in a proper way...

64. Gaudencio nods his head affirmatively.

65. Das Dores

Das Dores: /111
-Then, if you observe properly you'll see that we always have a special way to say things.

66. Gaudencio

Gaudencio:
-How?

67. Das Dores

Das Dores
-For instance: when we say to one person "Are you going?" it is different from "You are going!" isn't it? (Pause) Did you understand?

68. Gaudencio

Gaudencio
-Of course,...

69. Superimposition:
A R E Y O U G O I N G ?

-When we say, "Are you going?" we are asking the person whether he is going or not.

70. Superimposition:
Y O U A R E G O I N G !

-But when we say "You are going!", we are telling him to go.

80.	T/C Table top Words placed in such a way that there is a space for the punctuation which will follow.	Das Dores off camera: -I leave everything to the tailor but not to the doctor nothing I leave to the baker.
81.	Das Dores	Das Dores: -Then, each one took advantage and read it the way it would be better for him. For instance, the tailor read the sentences this way:
82.	T/C Table top Tailor's punctuation	Das Dores off camera: (She reads according to the table top) -I leave everything to the tailor, but not to the doctor. Nothing I leave to the baker.
83.	Das Dores	Das Dores -In his turn, the doctor read this way:
84.	T/C Table top Tailor's punctuation out. Doctor's punctuation in.	/114 Das Dores off camera: I leave everything to the tailor? But not, to the doctor! Nothing leave to the baker.
85.	Das Dores	Das Dores: -And the baker thought the correct reading of the phrases would be:
86.	T/C Table top Doctor's punctuation out. Baker's punctuation in.	Das Dores off camera: -I leave everything to the tailor? But not! To the doctor? Nothing. / I leave to the baker.
87.	Das Dores	Das Dores: -As you saw, the punctuation is very important, because it represents

		the...melody of the phrase, that is, that special way of speaking.
88.	Liborio	Liborio: -Melody... that's it! I had already noticed that when we speak, we make a...sound, even give a different tone in the words. Even when we say only one word.
89.	Das Dores	Das Dores: -Right, Mr. Liborio.
90.	Animated visual card "To the doctor?" "Nothing!"	Das Dores:off: /115 -A phrase can have various words... or only one word.
91.	Alexandre	Alexandre -Ah! that means that one phrase can be made by only one word?
92.	Das Dores	Das Dores: -Of course, as long as this word has that...sound, that tone that we give to the phrase.
93.	Cesaria	Cesaria -Well, Das Dores, the conversation is very good, but let's stop because it is time to go to bed.
94.	Das Dores	Das Dores (upset) -Now?
95.	Cesaria	Cesaria (decisive) -Now!
96.	Liborio	Liborio (amused by the discovery): -Ahaaa! Did you see? Das Dores said a one word phrase. (Imitating). "Now?"

97. Gaudencio	Gaudencio: -And Mrs. Cesaria too: (Imitating) "Now!"	/116
98. Das Dores	Das Dores: -Very well, I can see that you understood everything.	
99. Cesaria	Cesaria: -That's right, and I can see that you didn't understand what I said. Let's go, let's go!	
100. Cesaria and Das Dores go inside arm in arm; Das Dores looking back and smiling to say something.	Audio: Music goes up.	

Fadeout

3. Radio Production /117

3.1. Necessity for an Educational Radio Course

When the activities related to Educational Radio were going to be initiated in the SACI Project, the difficulties concerning human material needed for the execution of the Radio part were already known.

Reasons:

A - Educators, well intentioned and young, but lacking knowledge of the radio method and its language.

B - Radio professionals (producers) without sufficient background to face and become involved in an educational process.

C - Radio professionals (actors) attracted by higher salaries on TV and consequently absorbed into it.

D - Nonexistence of personnel with knowledge of the two areas (Pedagogy and Communication).

Therefore, the biggest concern was the training of professionals (producers, announcers, narrators, actors) able in their cultural level to understand the educational process, and by their sensitivity live the problems which we would and will face.

Thus, the first activity of the INPE concerning Educational Radio was a course of formation and training for production of classes.

3.2. Course of Production in Educational Radio /118

The first Course of Production in Educational Radio was conducted at the INPE in May and June 1971 with the following participants:

16 radio actors selected from among 300 college students from Sao Jose dos Campos;

5 producers, graduated from Schools of Communication of Sao Paulo State, who would be contracted after to work for the SACI Project.

Representatives of other states also attended the course:

1 pedagogue and 1 producer of the University of Brasilia (Federal District);

2 pedagogues from Rio Grande do Norte State;

1 pedagogue and 1 producer from Bahia State;

6 producers, 1 coordinator, 1 organizer of organized reception, and

1 pedagogue of the SRE (Educational Radio Service) of the Ministry of Education of Rio de Janeiro Radio Station (Guanabara).

In two months these elements participated in the whole process of Brazilian educational radio, mainly because the INPE brought in experienced elements from FEPLAM (Educational Foundation Padre Landell de Moura) of Rio Grande do Sul State, to assist in giving the course.

Radio theory was transmitted through classes and lectures, as well as the pedagogical part. Radio performers were trained in a rapid course on diction.

In the first part of the course, participants were requested to work on /119 production of sports programs, news programs, radio-theater, muscials and commercials; in the second part, elementary/school programs for the School Group in Jardim da Granja District, Sao Jose dos Campos; after that, programs

for lay teachers, chosen by pedagogues who participated in the course and after, programs for lay teachers, chosen by each of the producers, supervised by the pedagogues.

A total of 49 programs were produced; in the first part of the course 5 groups composed of different participants of the 3 areas were in charge of the production. In a second phase, the programs were written by the writers, in pairs, supervised by pedagogues and the assignment of radio announcers was made through the course coordination. In the final phase, each writer wrote his own program, under the supervision of one pedagogue, but handling the assignment and rehearsals of the radiocasters.

On termination, as planned, we formed a cast of 15 announcers and 5 producers who were hired by the INPE.

This course was followed by a phase of experimental production.

3.3. Experimental and Definitive Production

In the following 3 months (June, July and August) we initiated the peri-experimental production of programs for lay teachers within the planned program for the execution of the SACI Project.

This period of work helped the relationship between the pedagogues of the INPE and the radio writers then admitted. At the same time the radio-writers started their work intensively with a chance to evaluate their development.

The results were highly favorable: /120

Understanding between pedagogues and producers and more experience for the actors who still lacked a true sense of professionalism, but profited by the fact that they did not have bad habits known in the commercial sphere.

In December, we shall initiate the definitive recording of programs destined for Rio Grande do Norte state lay teachers, according to the flow chart of production presented in Chapter IV (Figure 4.2.).

This water will become potable if it is filtered and boiled. It will become more:

1 heavy
2. creamy
3. pure

13

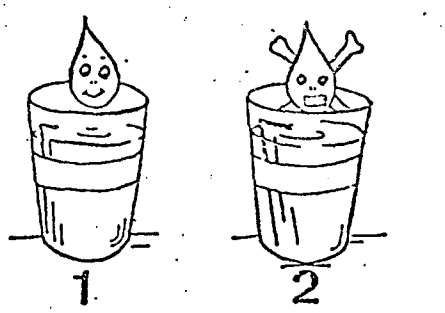
Chlorine is used to purify the water because it kills bacteria. It is used:

1. to make the hair shiny
2. in reservoirs of the big cities
3. to make plants grow on the farms

28

Check the water which can be used to drink, to take a bath, wash vegetables, cook, and irrigate the garden.

Treated Polluted Salted



47

Figure 5.9.

The purpose is to prepare the recording of the whole course, with a total of 480 programs until August 1971. As the beginning of the broadcasting of classes has been set for March there will be enough time to provide all needs, as can be seen in Figure 4.1.b.

4. Accompanying Material

In the SACI Project, TV and Radio are now combined with the most individual form of teaching, Programmed Instruction, in order to reach students in the most remote points of Brazil. These mediae form the only educational system which offers fundamental instruction to the student by means of advanced technology in communication and education.

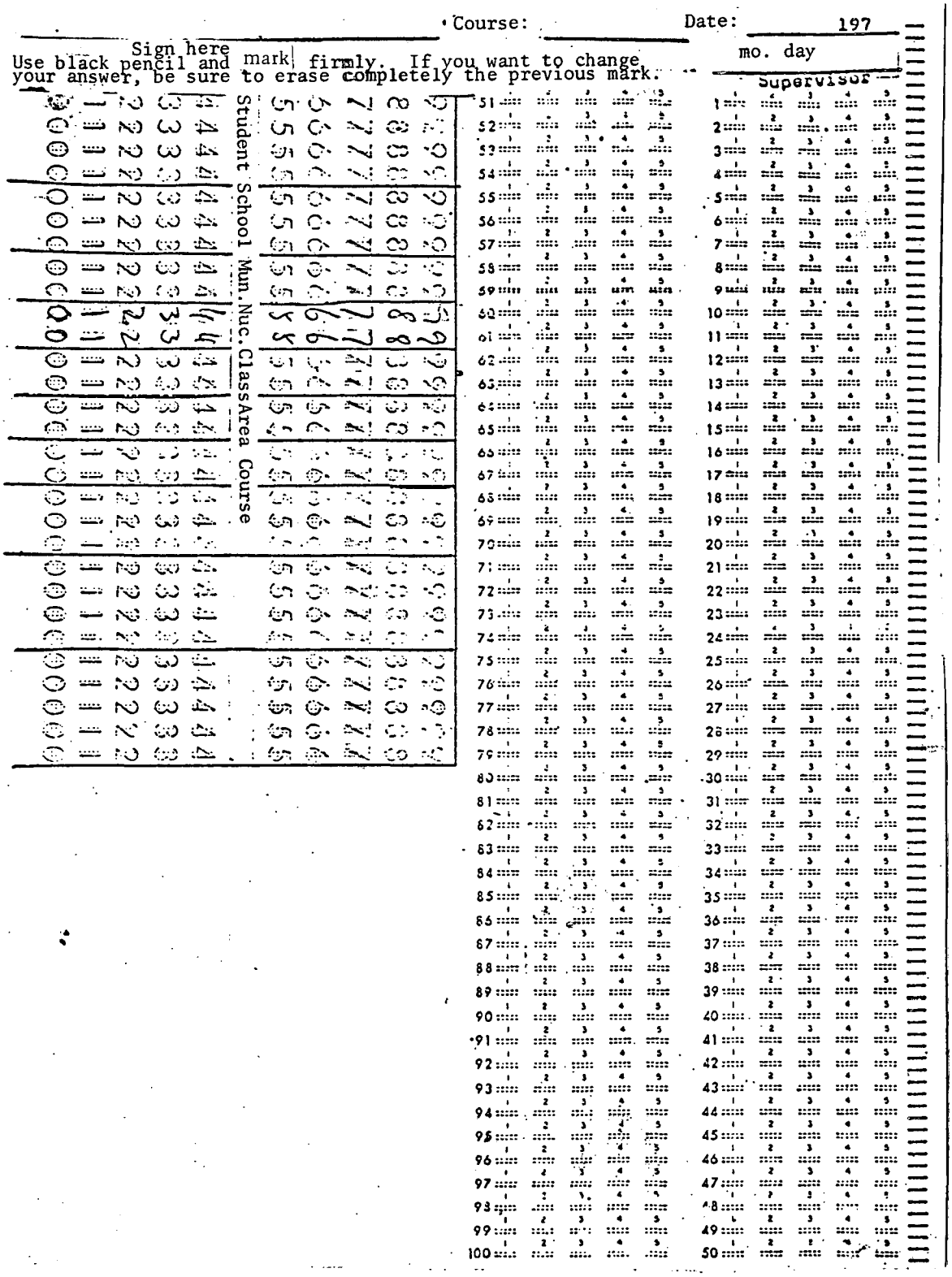
4.1. Material for Programmed Instruction

The Programmed Instruction in the SACI Project incorporates ideas carefully tested even though innovative in this type of self-guided learning. The student will have, for instance, a printed instructional unit for each program that he will hear on the radio or see on TV (Figure 5.10). Each unit of approximately 30 frames, or small blocks of information, also has an answer sheet /122 (Figure 5.11) which will be processed by computer. This sheet, with answers checked by the student as he progresses in the unit, has two functions.

First, the sheet shows the student's observed answer, showing active participation through the program. Here the SACI Project goes beyond the regular programmed instruction that sometimes requires answers from the student but it does not confirm that the student is involved beyond the simple task of reading the program.

The second function of the answer sheet concerns the continuous evaluation of the project by educators. Immediate feedback of the student's progress is provided by the answer sheet, with a significant value for the review of the existing assignments or preparation of new ones.

These answer sheets, then, eliminate certain disadvantages inherent in the regular programmed material, and the instructor is now able to control the effectiveness of the assignments in the course as well as revising rapidly the material in preparation.



/123

Figure 5.10.

All lessons in each area of instruction utilize at least 2 of the communications media: TV, radio and programmed instruction. Educational goals for any lesson dominate each medium, so that we have rich, varied and inclusive educational material available. As has already been done, lesson contents are specified by the production groups for each instruction area.

These contents are then transformed into scripts and units of programmed instruction.

Coordinators experienced in the transformation of information techniques /124
assist the groups in the application of principles of communication to the contents.

Additional assistance will be provided by supervisors of the publishing houses involved in the project. This integration of educators, specialists and material production consultants bring advancement to the art of programmed instruction.

However, requisites and basic concepts of programmed instruction remain absolute in the accompanying material production.

Each assignment is written in a format which requires active student participation at each step. Pictures with clear and precise information lead the student through an ordered sequence of material until he is asked to use (generalize) the information in a new situation.

The sequence is structured in such a way that the student must answer either by writing an answer (constructed answer) or filling in blanks, or making a multiple-choice selection or carrying out a combination of these (Figure 5.9). He also shows his answer on the enclosed sheet (Figure 5.10), thereby having a feeling of progressing through the program. He can answer, for example, all frames of a mathematics program; in some frames showing the acquisition or retention of a concept through an answer given in other frames, performing an operation, using examples supplied previously.

The process continues until he is led to generalize or transfer the in- /125
formation just acquired. A variety of "cues" help the student to reach this terminal frame, where he can use what he learned through the program.

No matter the type of answer requested in all frames, the student's correct answer is confirmed immediately in the program itself. Also, his progress in each lesson is reported to him through the answer sheet processed by computer. Thus, he learns how he is advancing in the lessons, and he is also being quickly informed of his progress in the course.

The accompanying material supplied to each student in the SACI Project follows in great part the linear format, and consists of material calculated for an assignment period of approximately 20 to 30 minutes. The student progresses through the unit at his own pace and is encouraged to use the accompanying material immediately after watching the TV and radio programs.

Actually, he will utilize the material during the last 3 minutes of some TV programs, when for instance, some stimuli of revision are presented and he is asked to record his answer on the corresponding sheet. Immediate confirmation of the correct answer will be given and reference will be made to the material for additional instruction.

In the programmed instruction material the student will find graphic material projected to evoke visual aids in the TV program (maps, photos and drawings).

Each instruction area imposes its restrictions and particular opportunities for innovation in the Programmed Instruction production. /126

The system used here in the SACI Project offers to students, previously isolated, a rich and stimulating educational experience.

4.2. Mark-Sense System

Figure 5.10 shown previously is a complete Mark-Sense sheet. It is an integral part of each unit of the accompanying material and is patented; the copyright was granted in Brazil to the INPE--Sao Jose dos Campos.

Two columns on the right-hand side of Figure 5.10 allow up to five multiple-choice selections for each one of 100 frames or alternatively up to ten relations of multiple-choice if only 50 frames are used.

The mark made by the students on this column is sensed by photoelectric lenses.

Besides the answers marked by the student, additional information on identification is marked on the left-hand side of the answer sheet.

This information will provide identification required for the accomplishment of the program. We will have information for the SACI Project which will permit identifying the student, his school, the municipality, etc. Besides, each course and each assignment will be identified by numbers; this set of numbers will permit the computer to identify the correct answers for a specific assignment in a given course and to make a comparison (for grading) with the information marked in the 2 columns on the right-hand side (students' answers). /127

The cards will be punched manually from the answer sheets in the initial phase of the SACI Project, due to the fact that the number of students is small and does not justify the cost of Mark-Sense automatic readers.

In previous experiments conducted with about 1,000 students a minimum number of errors was found when the sheet (Figure 5.10) was used. In the important section involving control, the left portion of the sheet, only one error was noticed in 500 sheets. Also, the computer program identifies any obvious errors made on the sheets. There are some errors, however, that the computer does not identify but, in the experiment conducted with 1,000 students they reported promptly the errors not identified by the computer, when they received their graded reports.

4.3. Processing Program

The computer program to process the Mark-Sense data has been intensely tested and used during more than one year.

This program is composed of 5 sub-routines.

1. Installation sub-routine (Set-up routine). It is used only once at the beginning of the course.

2. Grading sub-routine. It is used for each assignment.

3. Printing sub-routine. It is used every time printing is needed.

4. Modification sub-routine.

It is used every time it is necessary to transfer students from one course to another and/or correct mistakes of any kind in the data stored in the system.

5. Message Writer sub-routine. /128

It is used every time alpha-numeric messages are sent to one particular student.

CHAPTER VI

PRELIMINARY SYSTEM OF EVALUATION

This last chapter of the report presents the draft of the evaluation system /129
to be applied in the Educational Experiment of Rio Grande do Norte state, with emphasis on the pedagogical aspects. It is verified that Segment 02 of the SACI Project forms an innovation in terms of educational experiment, being an intermediate type between 2 of those defined by Campbell in *Handbook of Research on Teaching*, edited by N. L. Gage and published by Rand McNally and Company (Chicago, 1963).

1. Introduction

The aim of an educational evaluation, within the modern concept, is to improve the quality of the instruction for maximization of learning. Therefore, a modern system of educational evaluation must be characterized not only by the capacity of measuring results, but also of diagnosing failures and correcting the process.

In this sense, the evaluation will be more useful if it limits itself less to general results.

In the structure of the evaluation system of Segment 02 (Educational Experiment of Rio Grande do Norte State) of the SACI Project, we decided to make joint use of two forms of evaluation: (1) formative, i.e., one which, according to Seriven (1967), consists of a systematic follow-up of a whole cycle of programs and detailed analysis of the results obtained in each part or cycle unit, and (2) additive, which measures the system by its general results. The first, presupposing the quality of the student (capacity of learning), aims at the instructional material, while the second, presupposing the quality of the teaching material, aims at the student.

The evaluation of our experiment will be an essential part of the development of the SACI Project and must, for this reason, be accomplished with all possible scientific rigor. The data will be manipulated with maximum precision and independence in order to avoid any partiality in judgment.

2. Goals of Evaluation

The evaluation is based on the Educational Goals proposed for the Experiment, already presented in Chapter III, Educational Project.

Based on those propositions, the educational evaluation will be developed as a function of the following goals:

1. General

--to diagnose the situation of the experiment in the course of each mission and facilitate the correction of errors.

--measure the efficiency and effectiveness of the experiment supplying information for a future program of regional or national scope.

2. Specific

--to verify the efficiency/effectiveness of each system utilized in transmission/reception of programs (Radio-TV-RP-SS). We expect to determine by this the optimization for each vehicle per subject.

--verify the efficiency/effectiveness of class-programs per subject, including accompanying material. /131

--verify the students' production (1) in terms of behavioral goals of each class and (2) in terms of learning retention, comparing the results with those of the traditional system.

--verify the teachers' learning in the course for preparation for lay teachers, in each stage, (1) in terms of the behavioral goals of each class and (2) in terms of learning retention.

--verify truancy, failure and dropout rate, comparing the results with those of the traditional system.

--verify the efficiency of the supervision system in terms of functions of control, orientation and evaluation.

--verify the efficiency/effectiveness of the evaluation system.

--verify the cost effectiveness of the educational TV system in comparison with the traditional system.

--verify the degree of receptiveness of the educational TV system by teachers and students.

--verify the degree of receptiveness of the educational TV system by the authorities and community leaders.

3. Structure and Procedures /132

For the achievement of these goals we plan to sample 30% of the school population of the area of the experiment, this being 600 of the 2,053 public schools for primary teaching (elementary).

In order to assure the validity and generalization of the results, these 600 schools were selected at random, observing the proportions existing between 3 categories: grammar school, united schools and isolated schools.

This resulted in the distribution shown on Figure 6.1.

	Total	
Categories	No.	%
Grammar Schools	37	6.1
United Schools	63	10.5
Isolated Schools	500	83.3
	Number	%
General	600	29.2

Figure 6.1.

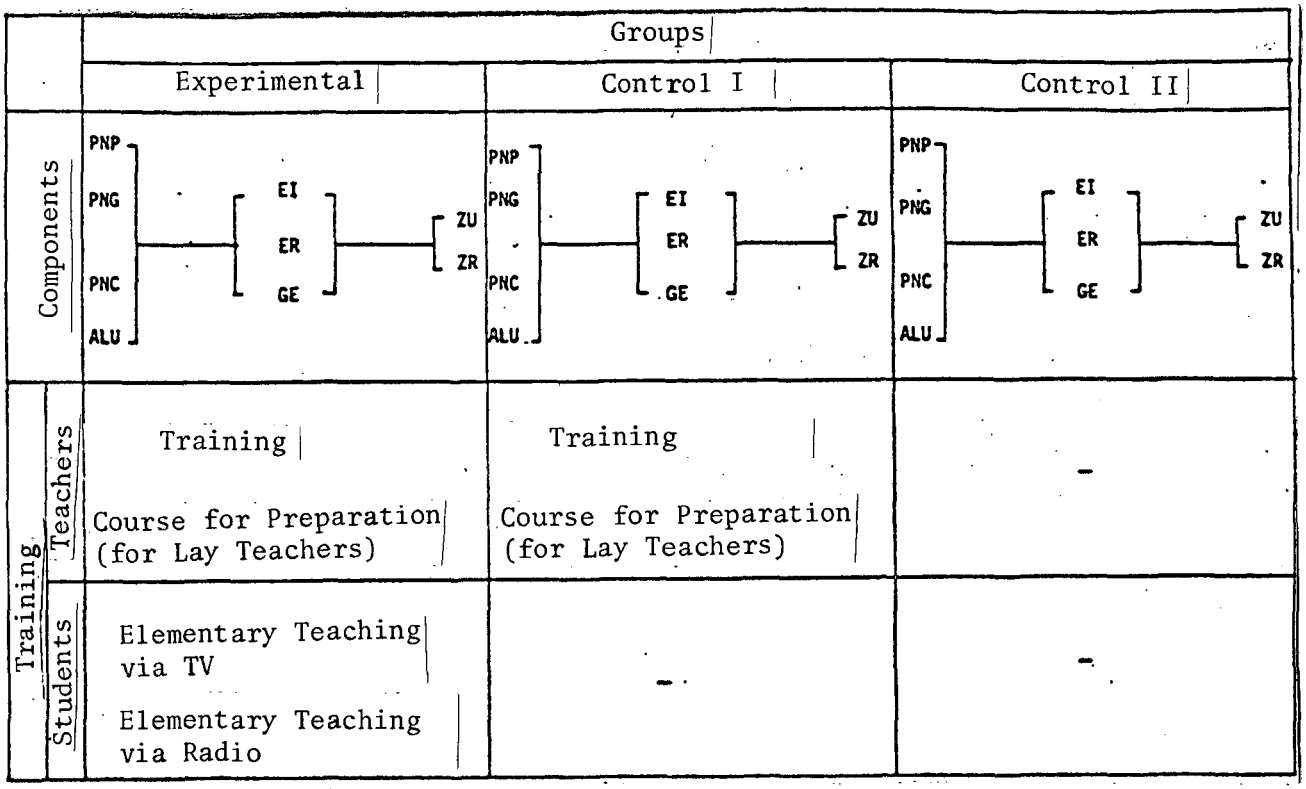
For operational effects, the sample was distributed at random in 3 groups, shown in Figure 6.2.

Groups	No. of schools	Total
Experimental	500	
Control I	50	
Control II	50	600

Figure 6.2. Distribution of the Schools Involved in the Educational Experiment of Rio Grande do Norte State (Segment 02).

Figure 6.3 presents the components of the 3 groups, as well as the type of training to be given to teachers and students.

Educational Experiment of Rio Grande do Norte State
(Segment 02). /133



Legend: PNP -- Primary level teachers; PNG -- secondary level teachers; PNC -- elementary teaching proficiency course teachers; ALU -- students; EI -- isolated schools; ZU -- urban zone; ER -- united schools; GE -- grammar schools; ZR -- rural zone.

Figure 6.3.

Assured of the similarity or equivalency of the components of the 3 groups /134 at the beginning of the experiment, we can demonstrate that any significant difference presented in the dependent variables between the experimental group and control groups is not due to initial differences between the groups but to the effects of the training.

Aiming to test the efficiency of the different systems of transmission/ /reception (isolated and combined) to be utilized, the experimental group will be divided into the sub-groups shown in Figure 6.4.

	1973			1974			1975	
Sub-groups	No. of schools	%	Sub-groups	No. of schools	%	Sub-groups	No. of schools	%
Radio	100	20	Radio	100	20	Ra	100	20
Radio	100	20	Radio	100	20	RP	100	20
TV	100	20	TV	100	20	TV	100	20
TV	100	20	TV + Ra	100	20	TV + RP	95	19
						SS	10	2
TV + Ra	100	20	TV + Ra	100	20	TV + Ra	95	19
TOTAL	500	100	-	500	100	-	500	100

Legend: Ra = Radio
RP = Programmed radio

Figure 6.4.

The evaluation system to be implemented will utilize the organizational structure of Segment 02 (see Figure 6.6) attributing to its components the following functions:

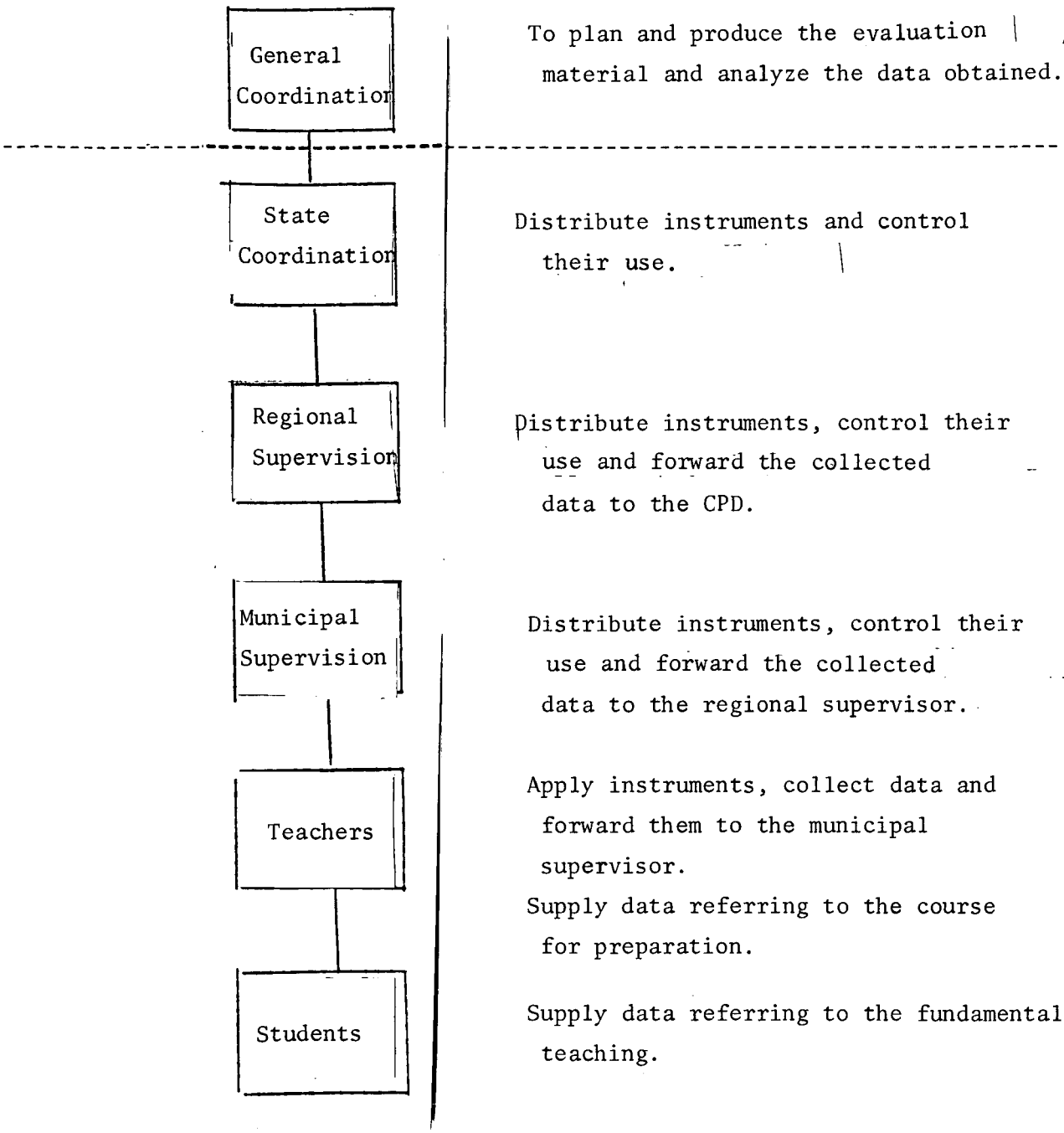

General Coordination
To plan and produce the evaluation material and analyze the data obtained.
/135
State Coordination
Distribute instruments and control their use.
Regional Supervision
Distribute instruments, control their use and forward the collected data to the CPD.
Municipal Supervision
Distribute instruments, control their use and forward the collected data to the regional supervisor.
Teachers
Apply instruments, collect data and forward them to the municipal supervisor.
Supply data referring to the course for preparation.
Students
Supply data referring to the fundamental teaching.

Figure 6.5.

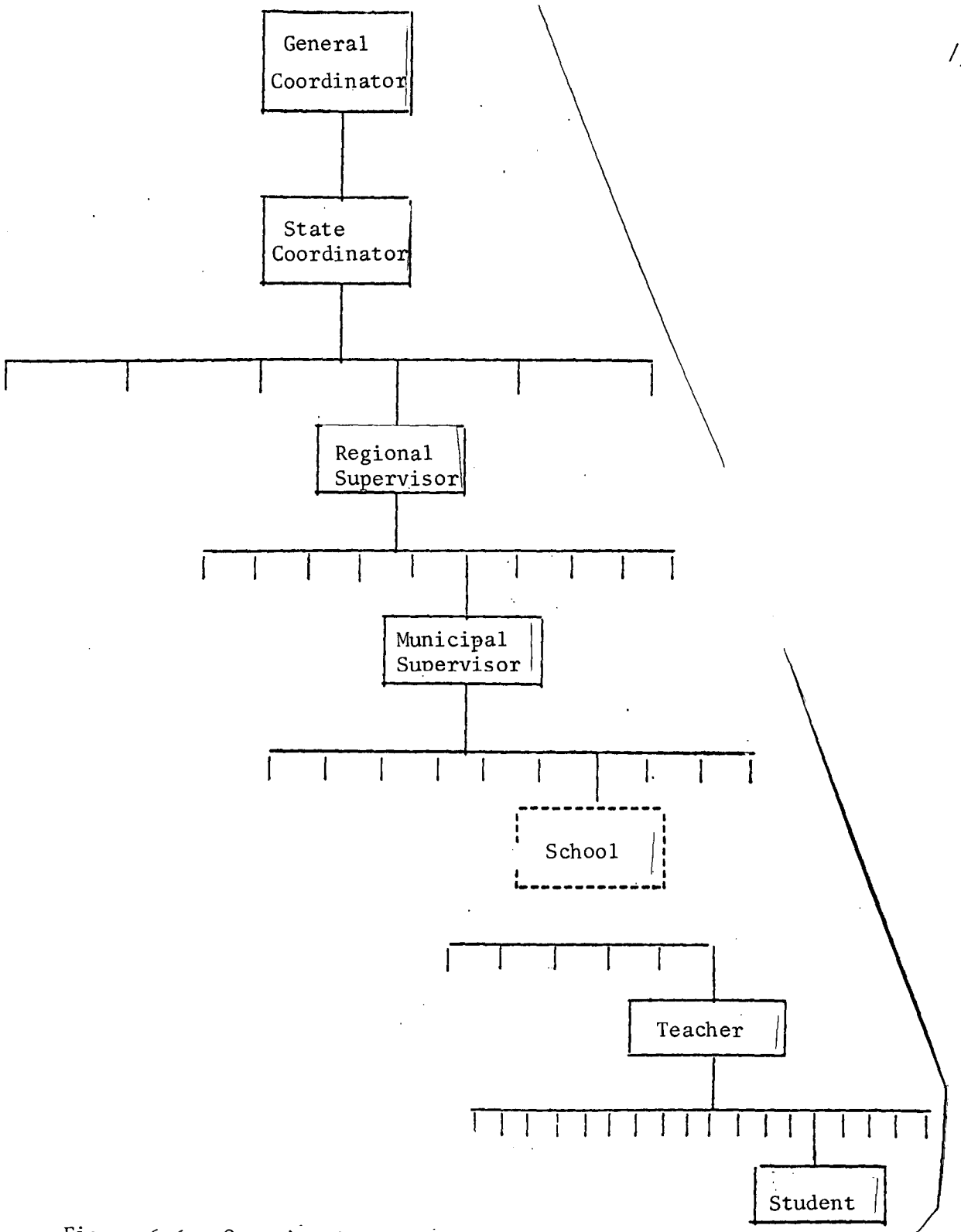


Figure 6.6. Organizational chart of Segment 02 of the SACI Project.

Within this structure we can establish the following flow for the distribution of instruments and evaluation and collection of data. /137

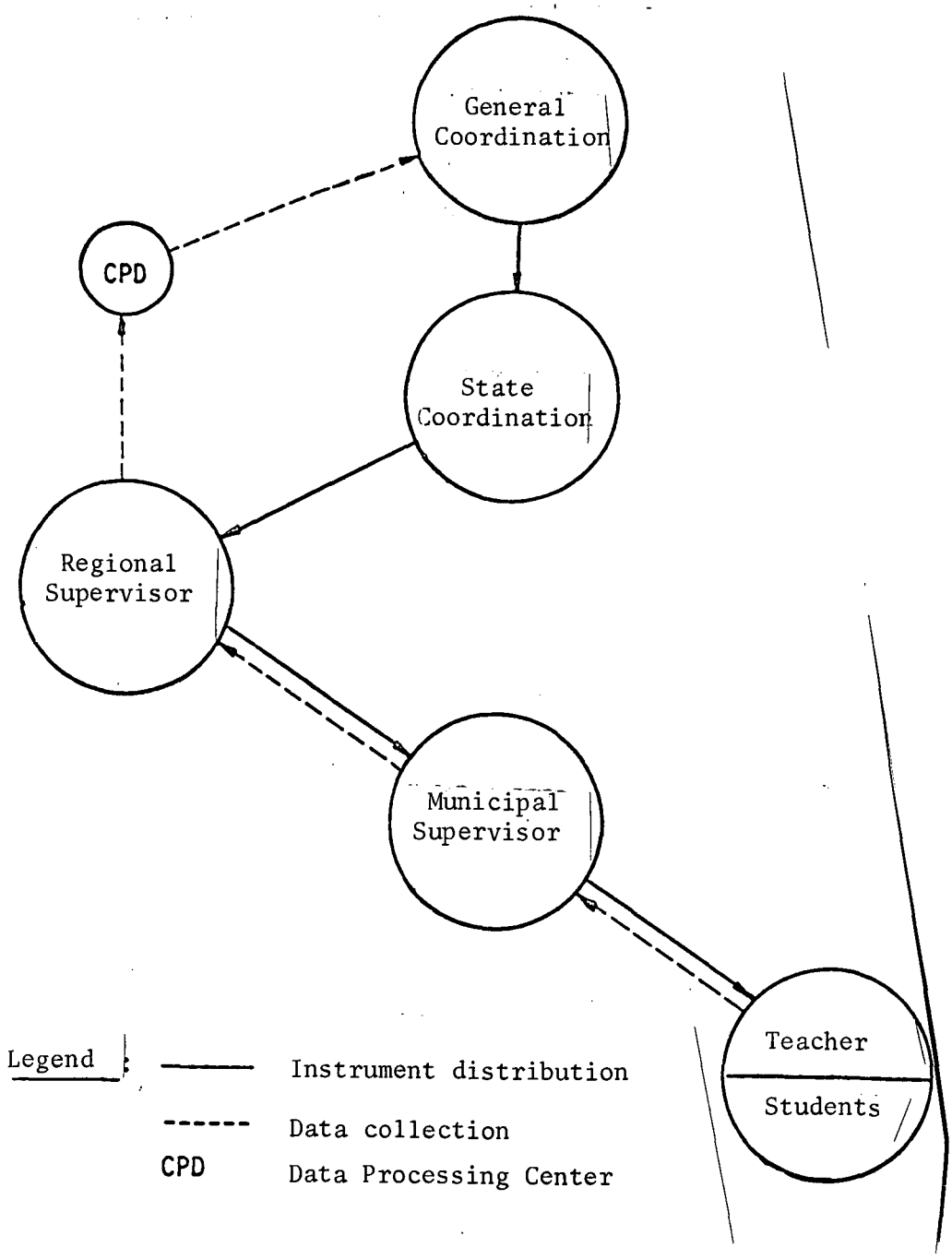


Figure 6.7.

4. Instruments and Cycle of Evaluation /138

Observation forms, patterned reports, questionnaires and objective tests will be utilized systematically as instruments for collection of data needed for evaluation. All these instruments will be submitted to statistical processing for effect of validation and reliability before their utilization in the experiment.

Attempting to maximize the precision in data collection and minimize their analysis time, we will utilize the "Mark-Sense" technique, using answer sheets of the Doheney or IBM type. (This will facilitate the optimization of feedback time between the broadcast of a class-program-reception-answer-evaluation--program.

The collected data will be subjected to optical reading and recording on magnetic tape in the CPD of the INPE/NF. The tape will be sent to INPA headquarters where the analysis will be processed and from where the results will be issued.

1. at the beginning and end of the experiment we will use questionnaires to register attitudes of authorities and leaders of communities located in the area of the experiment (for sampling), in order to determine the degree of receptiveness of the innovations introduced in the school system (TV and radio).

2. at the beginning and end of each school year we will use questionnaires to register reachers and students' attitudes (for sampling), in order to determine the degree of receptiveness to the educational TV and radio system.

3. Weekly, during the first 2 months, fortnightly in the next 2 and /139
monthly from the 5th month on, we will use questionnaires to register teachers' opinions about class-programs presented on the day of the use of the questionnaire, aiming to provide the production groups with vital information on the successes and errors of the programs presented for confirmation or correction.

4. We will use daily Mark-Sense answer sheets to measure the learning of teachers (course for preparation) and students (fundamental teaching) for determination of the improvement level.

5. At the beginning and end of each school year we will use objective tests (multiple choice and/or true-false) to measure learning retention of teachers (course for preparation) and students (fundamental teaching) for determination of the improvement level.

5. Final Considerations

The educational experiment objective of this evaluation could be identified with a medium term or combination of the following types defined by Campbell and Stanley (1963): First "Experiment with control group, pre- and post-test and randomization," which can be shown by the following diagram.

R O X O
R O O

(R = randomization) = observation or measurement; X = applied treatment, that is, experimental variable.

Second: "Solomon experiment with 4 groups," which represents an effort /140
to eliminate some difficulties of generalization inherent in the previous type. The presentation of this type of experiment can be obtained by the following diagram:

R O X O
R O O
R X O
R O

It is worthwhile to emphasize that these two types are considered "true experiments" in contrast to others which do not offer so much control of variables.

In the Educational Experiment of Rio Grande do Norte State, 3 groups will be involved, all of them formed at random. The first, the Experimental Group, will undergo complete training, that is, teachers and students will receive courses via technological means (TV and radio). The second, Control Group

I, GC-1, will suffer partial training (X); that is, the teachers will receive a course via technological means (radio) in order to preserve equivalency between the components of this group with those of the Experimental Group, thus keeping the experimental variable under control.

The third group, Control Group II, GC-2 will not undergo any training.

The educational experiment mentioned can be given the following configuration:

R O X O
R O X O
R O O

This is, therefore, a type of experiment different from those classified /141
by Campbell and Stanley. This represents one more responsibility for the evaluation, we have given, since the evaluation planning phase, particular attention to the factors which threaten the internal validity of an experiment (history, maturity, test application, instruments, statistical regression, experimental mortality and vitiated selection). In the same way, we have given special attention to the factors which threaten the external validity of an experiment (effect of interaction of the preliminary test with the training, effect of int interaction of a vitiated selection with the training, interference with the training or with the participants).

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